ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS

25c a Copy

OCT.
1939

cGraw-Hill Co.
Calif.

HURRY
ELECTRIC ROASTER Sale
YES MAM!
JUST WHAT I NEED IN MY KITCHEN
Roast, bake or broil...you can do
in Electric Roaster
FITS A SMALL SPACE
NOW
LOTS OF FOLKS DO MOST ALL THEIR COOKING ON AN ELECTRIC ROASTER
THAT'S BECAUSE ELECTRIC COOKING IS SO MUCH EASIER AND BETTER
ELECTRIC ROASTER Sale
The Cool Way to Cook Delicious Summer Meals
only $3 Down
PLUS SALES TAX
LOW PRICES AND EASY TERMS ON ALL POPULAR MAKES
GENERAL ELECTRIC
PROCTOR
NESCO
EVERHOT
YOUR DEALER OR EDISON OFFICE
See All It Does So Easily and Quickly!
SAY, THIS IS JUST WHAT I'VE BEEN WAITING FOR

Edison Advertising

KEEPS ELECTRIC ROASTER SALES GOING UP

Consistent Edison advertising has helped nurse the handy electric roaster along from a relatively unknown appliance to a lusty, fast selling item for electrical dealers in Edison territory. The latest Edison promotion sells cool cooking in hot weather at bargain prices, featuring the low price and many conveniences of electric roasters, and helping boost appliance sales in the summer season. Dealers who display and demonstrate the electric roaster find it a fast moving appliance, and a satisfying source of new profit.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

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To Help Reduce Street-Lighting Costs

ADOPT
The NEW Form 79 as Standard

THE NEW HOOD

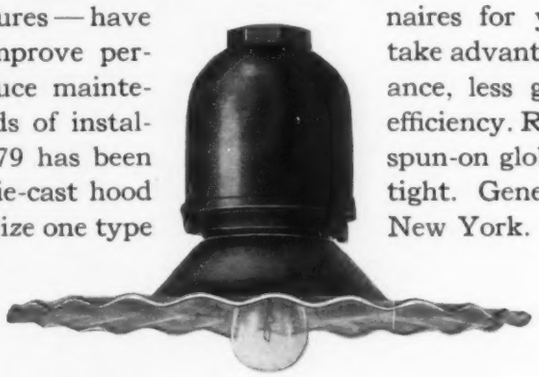
★ Has higher flashover value.

★ Is suitable for vertical or slip-fitter mounting.

★ Is dustproof with either external or internal wiring.

★ Can be used with either radial-wave reflectors or standard Form 79 reflector and globe.

EIGHTY per cent less glass breakage and forty to fifty per cent more light on the road have been among the advantages gained by operating companies that have modernized street lighting with the G-E Form 79 luminaire. The spun-on globe and stepped reflector—exclusive Form 79 features—have proved their ability to improve performance records and reduce maintenance expense on hundreds of installations. ★ Now the Form 79 has been improved again. A new die-cast hood will enable you to standardize one type of equipment and yet have flexibility to meet all general street-lighting requirements. Your lineman can interchange enclosed fixtures and radial-wave reflectors without changing socket adjustments or wiring. You no longer need keep duplicate stocks. ★ Try Form 79 luminaires for your next installation and take advantage of better lamp performance, less glass breakage, and higher efficiency. Remember that the exclusive spun-on globe keeps the Form 79 dust-tight. General Electric, Schenectady, New York.



GENERAL ELECTRIC

500-315

BETWEEN THIS MONTH'S COVERS

Bonneville Interview

"BONNEVILLE INTO ITS PROPER PLACE" (p. 27). A representative of ELECTRICAL WEST conducts an illuminating interview with the newly appointed Bonneville project head, Dr. Paul J. Raver. And together with this intimate talk, in which Dr. Raver pulls no punches, shies from no questions, Electra's Husband has a word to say about Bonneville's administrator in ELECTRA'S REACTION TO RAVER. (p. 22).

Standardized

CONSIDER THE ELECTRIC RANGE (p. 29). Burdett Moody is business agent for the Bureau of Power & Light in Los Angeles. In this complete article, he presents specification standards for domestic electric ranges as developed by the Bureau, when they recognized a definite need for improvements in the range's structure and performance. Carefully planned and carefully worked into sales policies, these standards are giving salesmen a real foundation upon which to give customers better service, and incidentally a better range for their money.

On and Off

CAPACITORS SWITCHED BY AUTOMATIC UNIT (p. 40). A Tucson circuit serving a heavy motor load was equipped with capacitors. Voltage after an interruption, when time-delay relays were returning load to the line, was apt to be excessive. Hence automatic equipment was devised to disconnect capacitors, restore them as load returned. Such equipment is being made available by manufacturers, but the economical unit described has been in successful operation many months. Author, and the man who designed the equipment, is R. V. Sanford, electrical superintendent of Tucson Gas, Electric Light & Power.

Quiet in Hollywood

SILENT LIGHTS FOR THE MOVIE INDUSTRY (p. 41). On movie sets, where sound pictures are taken, no extraneous noises can be tolerated, yet such sets require heavy d.c. supply, especially for lighting. To deliver this power, G-E designed and furnished sound-proofed motor-generator sets. These are described by G. F. Maughmer, with G-E at Los Angeles.

Big Saving

$135,000 INVESTMENT DEFERRED (p. 42). Installation of a synchronous condenser was contemplated in Salinas Valley, served by PG and E, to correct power factor. Cost of such an installation was estimated at close to $135.000. A study of the system revealed, however, that addition of the machine could be deferred for several years if static capacitors were appropriately installed. Cost of this procedure was on the order of $30,000. Author is J. F. Roberts of P.G. and E's Coast Valleys Division.

Heat by Walls

WARMING THE WALL BY REVERSE CYCLE (p. 48). C. E. Boggs, Idaho Power Co. designer, Boise, has taken real care that he and his family get good solid warmth in their new home. Using reverse cycle heating, he had 6,000 ft. of copper tubing laid on the lath before plastering. No other heating system was installed, except a fireplace which has not been used as yet. Figures as to kw.-hrs. burned as compared to oil fuel are given, and some interesting ideas are brought to light. Boggs hopes now to reverse the compressor connection during the summer time and cool the house in the hot months.

Turkey Bath

ULTRAVIOLET FOR GOBBLERS INCREASES FARM LOAD, (p. 51). Down in southern California, a flock of turkeys are really lucky birds. Every mid-winter, those that survive the previous swing of the axe, are given an ultra-violet light bath, together with young birds that will grace Thanksgiving tables throughout the country. To the Nevada-California Electric Corp. this has meant sizeable off-peak loads.

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Cover: Charles Morris Green, age four years, and Hortense Kinchen, at the Edison Plug-in Kitchen exhibit, Pomona Fair

Get Together

ROCKY MOUNTAIN CONVENTION (p. 54). Getting municipal and private system men together to pool their experience with common difficulties is often mentioned as a good idea, too seldom actually occurs. At its Estes Park convention in Colorado last month, the Mountain league took a real forward step when it sponsored meetings in which representatives of both kinds of systems participated. Public relations were constructively discussed.

Chain Invasion

CONTRACTORS (p. 56): Discovery was made by the electrical contractors associations meeting in joint convention at Asilomar that chain mail order houses were fast entering their wiring field. Potentialities of stronger cooperation with labor were also explored. A prequalifying examination was announced by the Contractors License Board. Legality of bid depositories was given proof. New sales opportunities in every home town were illustrated, and new fluorescent lighting developments demonstrated.

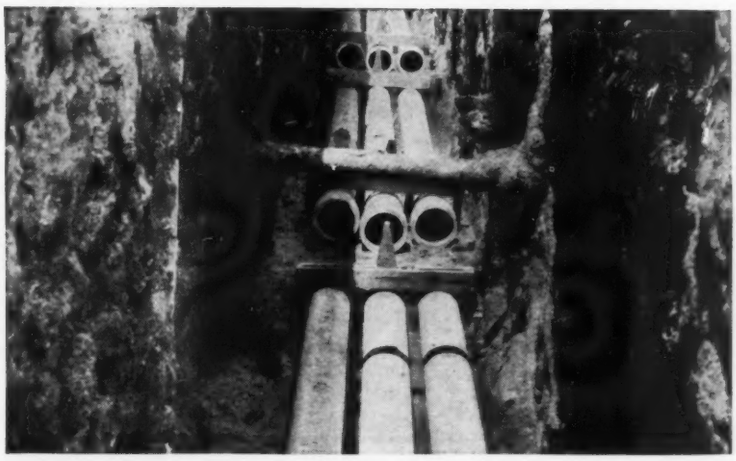
This Happened

NEWS OF THE INDUSTRY (p. 60). City of San Francisco upheld by U.S. circuit Court in its Hetch Hetchy agreement with P.G. and E. . . . Seattle plans a $1,000,000 bond issue for City Light to make extensions in the utility's system made necessary by increased public power usage. . . . Washington and Oregon courts filled with PUD condemnation proceedings, rulings and hearings. . . . Bonneville project new rates approved by FPC. . . . Raver names Creim new principal engineer. . . . new Vancouver-Kelso line under way. . . . bids on Bonneville line to Raymond, Wash. opened Oct. 6. . . . San Diego Consolidated, Albuquerque Gas & Electric, Coast Counties Gas & Electric Co., West Coast Power Co., and Utah Power & Light declare reduced electric rates. . . . Al Nicoll appointed assistant to Graybar Electric Co. president in New York. . . . P.G. and E. personnel changes. . . . .

QUICK FACTS ON DUCTS...

YOU DON'T NEED CONCRETE

Transite Conduit retains its true form under sustained loads... requires no concrete envelope underground or in exposed locations. When "concreting-in" is specified, the thinner walled J-M Transite Korduct provides the same durability and smooth interior at lower material costs. Both types of Transite Ducts are light in weight, easily handled.



YOU CAN FORGET CORROSION

Smoke, acid fumes, weather or corrosive soils have little or no effect on J-M Transite Ducts. Made of asbestos and cement, they will not rust, rot or decay. Furthermore, Transite Ducts are completely incombustible, do not add to gas formation if burnouts occur, and have exceptional resistance to flame and arc. Maintenance costs are practically zero.

YOU GET FASTER CABLE LAYING

Cables pull easier through the smooth interior of Transite Ducts. Even after years of service this hard surface stays smooth, joints remain tight. Cables are readily removed and replaced.

• • •

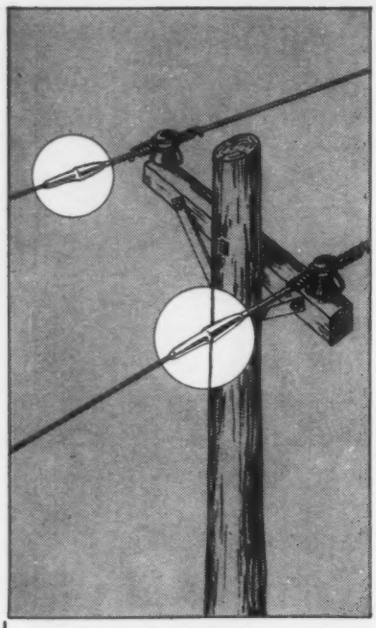
For complete facts on Transite Conduit and Transite Korduct, let us send you Data Sheet Manual DS-410. Write to Johns-Manville, 22 E. 40th Street, New York, N.Y.

SPECIFY

Johns-Manville TRANSITE DUCTS

FOR LOW-COST DISTRIBUTION

Modernize
YOUR DISTRIBUTION PRACTICE—



Urban construction where line drops portion of load and smaller wire size will carry current flowing through the rest of circuit.

RELIABLE STRAIGHTLINE REDUCERS . . . .

Save money and clean up appearance while eliminating a double dead-end. Sag of larger wire is only increased two or three inches as spans of city distribution are short.

Reliable
ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
1105 CARROLL AVENUE • CHICAGO, ILLINOIS

NEW PRODUCTS

Multi-Breaker (1001)

Colt's Patent Fire Arms Mfg. Co. has recently announced an addition to its line of Colt Multi-Breakers. The new type MO is a small compact device that will serve as a service center or load center for lighting or appliances. It can be used to good advantage when additional circuits must be added.

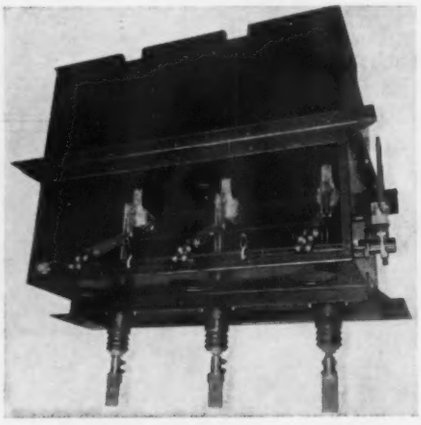
It is absolutely safe, tamperproof, simple in construction and operation. Designed for 15, 20 and 25 amp., it may be supplied for either surface or flush mounting.

Wire-wound Resistor (1002)

A new vitreous enameled wire wound resistor has been announced by Ward Leonard Electric Co. Intensive research in development work on refractories, wire processing and enamels has produced this crazeless enamel structure that withstands humidity, moisture, immersion and numerous other specified tests.

Group-operated Switch (1003)

Safety was the predominant thought of Delta-Star Electric Co. engineers, who designed this metal-enclosed, group-operated switch, installed below a type H breaker, and connected to leads in a concrete cell structure. The 7,500 V., 600 A., 3-pole switch with full-floating blades and line pressure contacts is operated by hook type handle with key to lock in open or closed positions. Windows permit inspection of each pole. A screwed type cover completes the enclosure.



For Successful
RADIANT ENERGY DRYING *And* **HEATING**

Use Nalco Dritherm —Infra-Red Ray— Carbon Lamps

Nalco Dritherm Lamps have proved superior in service . . . are being used today in large heating and drying installations throughout the country. Radiant energy drying with Nalco Dritherm Lamps will enable you to provide drying equipment in a minimum of space . . . cut drying costs and time . . . secure uniform results and eliminate oven "warming up" time. These lamps are a prime source of radiant energy and have been especially adapted to this new method of drying and heating.

VALUABLE DATA AND INFORMATION

As pioneer manufacturers of lamps for radiant energy drying we have collected considerable experimental, test and operation data on radiant energy principles. Write for latest details on use of Infra-Red Ray Radiant Energy — for drying and heating. Full details and prices on request.

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Los Angeles, California
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FIVE "IDEAL" MONEY MAKERS

Wire Nuts
"Solderless—Tapeless wire connectors." Skin Wires—Screw On —That's All! One size for all common wiring joints. Fully Approved — Listed By Underwriters' Laboratories, Inc. MILLIONS IN USE!

2. "E-Z" Wire Strippers
Strip the toughest insulation without nicking or cutting strands. Models and sizes for stripping solid or stranded wires from No. 30 gauge to No. 5.

3. Cable Ripper
For ripping non-metallic sheathed duplex cable or lead covered cable. Cuts cleanly — easily— quickly.

4. Joist Boring Machine
Ends tiresome and dangerous reaching. Bores holes at any angle—reaches to 11 ft. height above floor, bores beneath floor.

5. Fish Tape, Reel & Puller
NOW fishing IS a pleasure! You get three tools in one—Fish Tape, Reel and Puller. Keeps tape reeled up — no expensive tape breakage — no "live" contacts. NEW! "Junior No. O"— Price $2.50. Easily fits in tool kit.

SOLD THROUGH JOBBERS

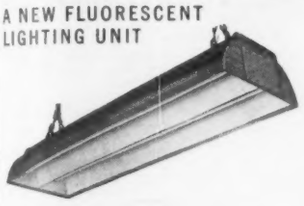
Electrical Products Division
IDEAL COMMUTATOR DRESSER COMPANY
1042 PARK AVENUE SYCAMORE, ILLINOIS

INCREASED INDUSTRIAL ACTIVITY DEMANDS EXTRA LIGHT

For Precision Operations . . . Rush Production . . . Inspection Work . . . Protection and Prevention of Sabotage

BRING THESE SPECIALIZED BENJAMIN UNITS TO YOUR CUSTOMERS' ATTENTION

A NEW FLUORESCENT LIGHTING UNIT



The FLUR-O-LITER

Provides "cold light" of soft diffused quality which improves Inspection and Precision Operations. Designed for two of the new exceptionally efficient 48" white and daylight Fluorescent lamps and featuring new type auxiliaries—high power factor—minimized flicker. Individual reflectors are Alzak aluminum hinged to housing for instant access to wiring, sockets, etc.

A SPECIAL UNIT FOR THE SILVERED BOWL LAMP

The RLM SILVER BOWL DIFFUSER

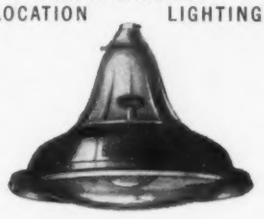
Engineered to the unique indirect lighting characteristics of the Silvered Bowl Lamp. Combines large Alzak aluminum and porcelain enameled steel reflectors to produce soft, well diffused light. As with many Benjamin units, it is available with patented TURNLOX hood construction which permits the reflector and lamp to be removed as one unit for easy cleaning on floor.

FOR STOCK ROOMS, TOOL CRIBS, WAREHOUSES

The STOCK-BIN-LITE

Provides uniform lighting from top to bottom and from end to end of stock bin aisles, etc. The deep reflector directs ample light even to bins near floor. Deflector directs light upward above cutoff. Apertures in ends build up light between units. Lamp is shielded by reflector, reducing glare.

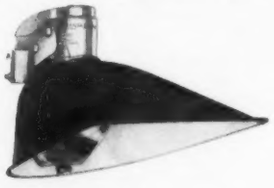
FOR HAZARDOUS LOCATION LIGHTING



The VAPOR-SEAL REFLECTOR

A dome-type fixture with the entire reflector opening covered with heat-resisting glass. Weather, moisture and vapor proof. For installation in locations where combustible, organic dusts are in suspension and locations where ignitable materials are present as covered in Class II, Group G and Class III and IV listings of the Underwriters' Laboratories.

FOR SAFEGUARDING PLANTS AGAINST SABOTAGE



The DUO-SERVICE FLOODLIGHT

A double duty, weather-resisting, high efficiency floodlight for protecting yards, grounds and buildings with wall of light. Consists of two reflectors, one of porcelain enamel for greatest ground coverage and one of Alzak aluminum which can be adjusted to direct a powerful spot on certain desired areas. Also available for the new Hard-glass lamps.

Use Benjamin Sales Assistance to SELL MORE LIGHTING NOW

Benjamin's district representatives and lighting specialists are at your service. They will be glad to show you samples of any Benjamin lighting unit, supply you with any needed information and work with you in making demonstrations.

Write Benjamin Electric Mfg. Co., Des Plaines, Illinois, for name of your nearest Benjamin wholesaler and for literature on any of the Benjamin units. Remember when you sell Benjamin you have back of you the resources of the world leader in industrial lighting. Make use of them.

BENJAMIN TRADE MARK

LIGHTING EQUIPMENT

Distributed Exclusively Through Electrical Wholesalers

Vent-A-Hood kitchen ventilator equipped with a GREASE TRAP to keep ceiling and walls clean—a patented centrifugal exhaust unit that forces cooking odors, steams and vapors out before they have a chance to invade the rest of the house . . . . Investigate this modern kitchen ventilator before you build or complete your plans. It's new, modern efficient. Exhaust unit may be had separately or with the hood. Ask for illustrated folder.

The VENT A HOOD Co.
2808 COMMERCE STREET
DALLAS. Dept. E TEXAS

Electric Heater (1004)

A new small portable electric heater, guaranteed for 5 years against burnout, is offered by the Wesix Electric Heater Co. This heater comes in six colors: sequoia brown, cambodian ivory, yerba buena green, pacific blue, treasure isle coral, mandarin red, and all

with matching handle and legs. These colors will not peel or discolor from heat and are stain-resistant. Heater also both radiates and circulates heat at the same time.

Clip-on Ammeter (1005)

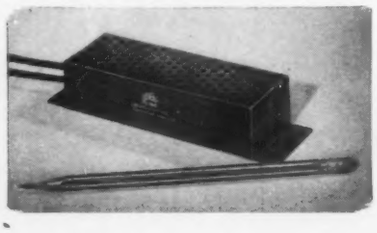
A new multi-range clip-on ammeter has been introduced by Ferranti Electric, Inc. This new instrument reads from 0 to 1000 amp., having five full scales of 0-10/25/100/250/1000 amp. There is only one single, simple set of scale divisions and all full scales are multiples of 10 or 25. Meter has a 2¼″ rectifier opening which makes it adaptable for use on square bus bars and round cables. Clamping jaws are well insulated.

Photo-electric Counting (1006)

Photo electric counting equipment and a general purpose contact relay, model 566, has been newly developed by Lipman Engineering Co. This new type operates on direct current which allows maximum sensitivity and ease of maintaining adjustment. Control relay is plug-in type and can be removed easily. Estimated tube life is 7,000 to 10,000 hours. Equipment has been tested for speed of counts up to 600 per minute.

Resistor (1007)

A new type IRC type FL resistor has been introduced by the International Resistance Co. Constructed so as to provide maximum heat dissipation in minimum space, they are of the insulated wire wound type with 1,250 volt insulation. They will operate at a tem-



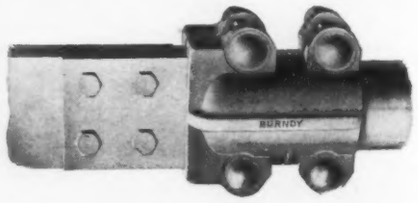
perature rise of approximately 40° to 50° C. with standard auxiliaries. Overall box dimensions are 6⅜″ x 1¾″ x 1¼″. Total assembled weight of the unit is less than 12 oz.

Noise Analyzer (1008)

An electrical "tin ear" which will enable unskilled workers to detect flaws in running machinery has been announced by Electrical Research Products, Inc. This device, called the "Industrial Noise Analyzer," measures the intensity of sound at any preselected pitch and turns a deaf ear to other factory noises. Should there be any variation from the normal sound frequency intensities, the dial warns the operator that his machine is defective and may "freeze up" or break down on him. Equipment consists of a microphone, electrical wave filters, an amplifier and meter.

Connector (1009)

An electrical connector for flat bar, type FE, is presented by Burndy Engineering Co. It is designed to join laminated flat bars to tube or cable. Connectors of this type have



been furnished for all sizes of cable or tube to be joined to any sizes, spacing or number of flat bars.

Multi-Breaker (1010)

A new development in Multi-Breakers has been announced by Cutler-Hammer. This small size, type MO multi-breaker is rated from 15 to 25 amp. and is designed for use in the homes, shop, commercial building or farm. It functions as an entrance or service switch with overload and short circuit protection on lighting circuits, oil burners, stokers and water heaters, refrigerating units, etc., or wherever fused type switches are employed.

Slo-Blo Fuse (1011)

"Slo-Blo" fuses were developed by Littlefuse, Inc., to carry harmless inductive or capacitative surges and overloads for a reasonable period of time, but on the other hand to blow before the danger point is reached, thus preventing needless blows. They are a dual purpose fuse having a simple fuse link, a resistor element which provides heat inertia

or time lag. A spring (C) serves not only to open the circuit, but takes up expansion of (A), thus preventing crystallization on repeated heating and cooling. They are offered in nine ratings, ranging from 1 amp. to 1/100 amp.

Circuit Breaker (1012)

A new oilless type circuit breaker for 15,000 volt service at interrupting ratings from 500,000 to 1,500,000 kva. has been introduced by General Electric. Named the "air-blast" breaker, it has a separating interrupting unit for each phase. The air-blast chamber may

be inspected easily by removing a side plate. The chamber itself is of fan-like design; small where the air-blast is introduced and large as it emerges with the tall cylindrical muffler.

Yard Light (1013)

A new yard light line has been developed by the Steber Mfg. Co. These yard lights are available with weather-proof, special processed enameled or porcelain enameled shallow dome reflectors and porcelain enameled standard dome and angle reflectors, all of the shade holder type. Distinctive fea-

ture is the new junction box. This approved fitting is a weather-proof pole or wall mounting bracket outlet box, designed for conduit installations (without use of auxiliary fittings) or for service entrance cable with connector.

Downlight (1014)

A plastic downlight has been developed by the Wakefield Brass Co. It features a satin aluminum hanger combined with a 19″ plastic reflector having a new type of louver for downlighting. The louver is of new radial design for wide distribution over counter areas. It has a E. T. L. rating of 86.5%. Of light utilized, 30% is directed downward and 70% upward. Accommodates lamps from 300 to 500 watts. A smaller unit is available for use with 200 and 300-watt lamps.

Toaster (1015)

A completely automatic toaster that "pops up" toast or keeps it warm has been introduced by the Chicago Flexible Shaft Co.

This new Sunbeam model is equipped with a button which may be set for either type of operation. It has a double-thermostatic control, and a hinged crumb tray for easy cleaning.

Starter (1016)

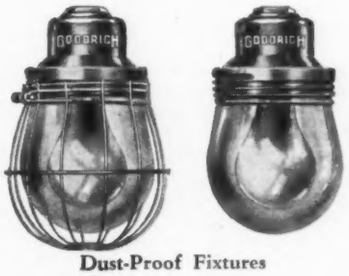
To meet the demand for an automatic starter for smaller sizes of polyphase and single phase motors, the Square D Co. announces the new size 0, type R, class 8536 starter. Maximum polyphase ratings are 2 h.p., 220, 440 and 550 volts; maximum single phase ratings are 1 h.p., 110 volts or 1½ h.p., 200 volts. This starter has a vertically operating magnet, double break silver contacts and thermal overload relays.

Ventilator (1017)

A new home and office ventilator, the Ventrola, to be installed directly in window pane, has just been announced by the McLaughlin Ventilator Co. This steel enclosed glass louver solves the problem of room ventilation without loss of light. Two models, for vertical or horizontal position, are completely automatic. Finish is in white porcelain, white enamel or polished finish with chrome plated fan blades. The fan is 10″, 9-bladed pressure-type.

Dust-Proof Fixture (1018)

A dust-proof fixture, with heavy threaded clear glass globe, has been presented by the Goodrich Electric Co. For use in flour and feed mills, grain elevators, coal pulverizing plants and similar locations, this fixture has



Dust-Proof Fixtures

a one-piece copper hood, is also moisture and weather proof. It is offered in sizes to accommodate lamp sizes from 25 to 150 watts. Has a resilient socket which may be easily removed for quick wiring.

Washer (1019)

An electric washer that actually "watches itself," has been introduced by Westinghouse Electric & Mfg. Co. This washer, the new "Emperor," is the first model announced in the 1940 Westinghouse line. A time dial shuts off the washer automatically at the end of a predetermined period. This new timer also lists the correct washing time for every type of fabric, eliminating all guessing and clock watching. It is fully skirted and streamlined right down to the casters.

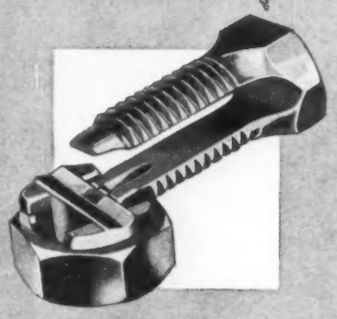
Table-top Stove (1020)

A table top electric stove, with a high-tempered alloy steel body, finished in heat-resisting enamel, has been announced by Samson-United Corp. Construction is patterned after the conventional kitchen range. The heating coils are embedded in solid steel rock with nickel-chromium element wire, steel casing and chemi-rock encasement, thus eliminating danger from shock or burns due to accidental contact. Shipping weight of the deluxe cooker, two hours and four heats, is only 13 lb.

Copper-Oxide Rectifier (1021)

Into a much smaller space goes a copper-oxide rectifier for oil-circuit-breaker operation announced by General Electric. Rated 50 amp., 120 volts d.c., 220 volts a.c., for 2-cycle operation not exceeding 4 per min., the new unit will do the job which previously required 16 or 17 of the 3-amp. units which it replaces. It is about one-third smaller than the old unit. By increasing the number of oxide washers in each leg, lower working potential (16.4 volts) and greater factor of safety were obtained.

Saves Time
Saves Material
Lasts Longer



The Blackburn Connector is easier to install. There's no loose nut to hold—no loose parts to drop—a real saving in time and material. It's made of Duronze, actually stronger than steel and more non-corrosive than pure copper. It's truly a life-time connector.

JASPER BLACKBURN PRODUCTS CORP.
Main and Clinton Sts. ST. LOUIS, MO.

4 REASONS why BUSINESS MEN BANK BY MAIL

1. **Economical** because it saves their valuable time.
2. **Convenient** wherever they live or travel.
3. **Efficient**—overnight service to most points in California.
4. **Safe** as the U. S. Mails.

Write today...
for free Bank-by-Mail kit containing all necessary forms, return envelope and simple instructions.

CROCKER FIRST NATIONAL BANK
OF SAN FRANCISCO
California's Oldest National Bank
Member Federal Deposit Insurance Corporation

KLEIN
"Lightweight"
CLIMBERS

Klein "Lightweight" Climbers are built to the minimum weight possible consistent with maximum safety. Every pair is tested exactly the same as are the old time tried Standard Climbers. The lineman can throw his weight on these climbers with confidence —they are Klein's!

DISTRIBUTED THROUGH JOBBERS

Foreign Distributor: International Standard Electric Corp., New York

The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want:

- ☐ Lightweight Climbers.
- ☐ Specifications on Linemen's Belts and Safety Straps.
- ☐ Klein Kord Fabric Safety Straps.
- ☐ Pocket Tool Guide.

Mathias KLEIN & Sons
Established 1857 Chicago, Ill. U.S.A.
3200 BELMONT AVENUE

PRODUCT DATA

Demand Meters (1022)

Indicating and recording demand meters that measure block-interval kva. demand under all conditions of load and power factor are described in a 24-page booklet issued by Westinghouse. The instantaneous values of the active and reactive components are added vectorially to provide accurate, direct registration of true kva. without computation. The outstanding features of these units is a ball mechanism that adds vectorially the motions of two separate elements and transmits that sum to an integrating gear strain, registering them as kva. hours or block-interval demand.

Fluorescent Line (1023)

A new fluorescent line, featuring the use of permanently finished Alzak aluminum reflectors, is illustrated in a new bulletin by the Edwin F. Guth Co. It covers industrial lighting, showcase, wallcase, stock-bin and general illumination equipment.

Cutouts (1024)

A new bulletin on distribution cutouts has been issued by Pacific Electric Mfg. Co. This type ET-2 non-drop-out device is available in two ratings, 1 to 50 amp. and 50 to 100 amp. and is offered in 5 kv., 7.5 kv., 12.5-Y kv. and 15 kv. sizes. Dimensional diagram and data and other information is given.

Switches (1025)

Just published by the Delta-Star Electric Co. is a 16-page bulletin describing their complete line of type "M" instrument, control and auxiliary switches. Features are the unit type construction permitting assembly of any number of stages, and the flexible four-way operation—right-left or push-pull. Seventy control diagrams are illustrated.

Control Equipment (1026)

A new bulletin has just been issued by Allis-Chalmers on their Type TLB Load-Ratio-Control equipment. It illustrates and describes heavy duty circuit breaker type load-ratio-control equipment used on large and high voltage power transformers. The TLB mechanism described is applicable for voltage and phase angle control.

Parkway Cable (1027)

A compact 4-page pamphlet by General Electric describes tellurium parkway cable, a combination of rubber insulation and tellurium-rubber sheath. Conductor, insulation, protective finish, variations are outlined, also applications, advantages, shielding. A chart listing various types of cable at varying voltages is included.

Universal Appliances (1028)

A complete catalog of Universal appliances is now offered by Lander, Frary & Clark. New designs, new patterns, new uses are included, together with illustrations of the appliances, features and full detailed descriptions.

TELESCOPE BM SYSTEM

CONNECTORS AND COUPLINGS
Cadmium Finish
for Electrical Metallic Tubing

B-M Connectors and Couplings make the neatest installations. No nuts to tighten, just two squeezes with our Indenter and the fitting is securely fastened to the tubing.

B-M fittings are so much lower in price that the savings on the first job will more than pay for the Indenter required. Our tools and method of fastening the fittings to the tubing are patented, and we limit the license of our tools under these patents to the installation of our fittings only.

Listed by Underwriters

No. 605. Price $1.35

DISTRIBUTED BY:
THE M. B. AUSTIN CO., Chicago, Illinois
CLAYTON MARK & CO., Evanston, Illinois
CLIFTON CONDUIT CO., New York City
GENERAL ELECTRIC CO., Bridgeport, Conn.
THE STEELDUCT CO., Youngstown, Ohio
TRIANGLE CONDUIT & CABLE CO., Elmhurst, New York City
ENAMELED METALS CO., Pittsburgh, Pa.
NATIONAL ENAMELING & MFG. CO. Pittsburgh, Pa.

BRIEGEL METHOD TOOL CO.
GALVA, ILLINOIS

THERE ARE "BESTS" IN EVERY INDUSTRY

IN ELECTRICAL APPLIANCES IT'S

Sunbeam

Automatic **MIXMASTER**
Double Automatic **IRONMASTER**
SILENT AUTOMATIC TOASTER
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SHAVEMASTER
FLAT TOASTER • FAN HEATER
GLASS COFFEE MAKERS
WET-PROOF HEATING PAD
MASTER PLUG & CORD SET

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CHICAGO FLEXIBLE SHAFT COMPANY
5600 West Roosevelt Road, Chicago, Illinois
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50 YEARS MAKING QUALITY PRODUCTS

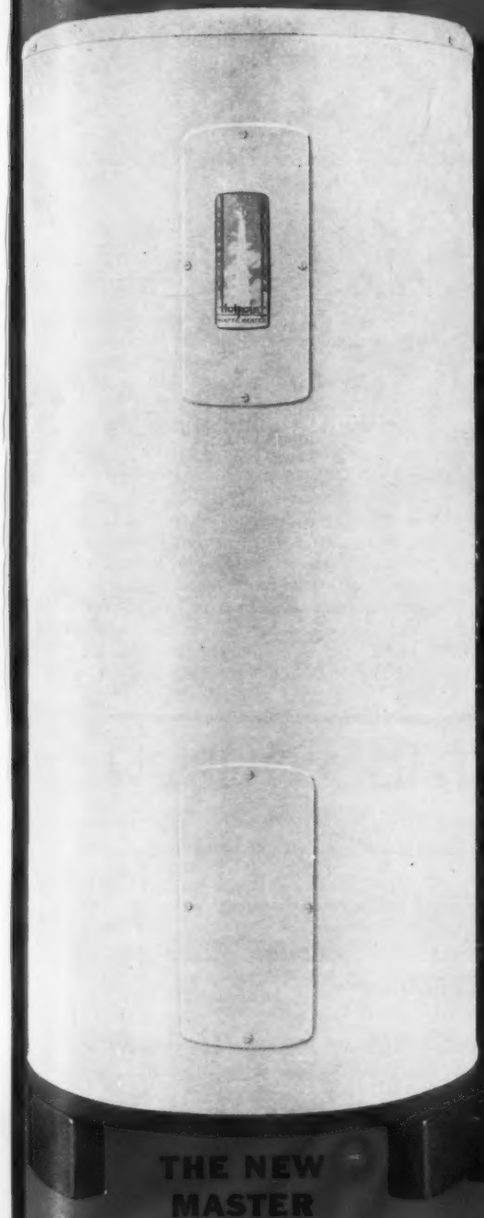
PRINT IN BINDING

Hotpoint WATER HEATERS..

..PRESENT A QUINTET OF SALES BUILDERS THAT WILL MAKE PROSPECTS..

..STOP LOOK and BUY

New Line of WATER HEATERS Featuring Newly Styled Streamlined Round Water Heater With Real Eye Appeal



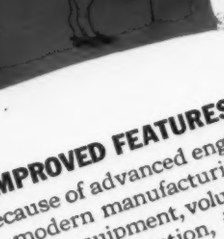
THE NEW MASTER

1 NEW ROUND DESIGN

Hotpoint adds instant eye and sales appeal to water heaters with beautiful new and brilliant styling and design — lustrous, gleaming, white Calgloss finish

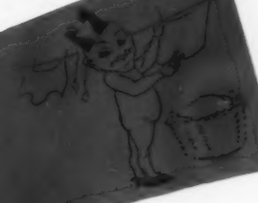
2 NEW LOW PRICES

Again Hotpoint leads the way in price reduction — bringing Electric Water Heating within the reach of millions of American homeowners.



3 NEW IMPROVED FEATURES

Because of advanced engineering, modern manufacturing methods and equipment, volume sales and standardization, it is possible for Hotpoint to offer these outstanding values.



4 NEW ECONOMY

Lower prices for original investment mean added economy to customers in purchasing the new Hotpoint Electric Water Heaters.

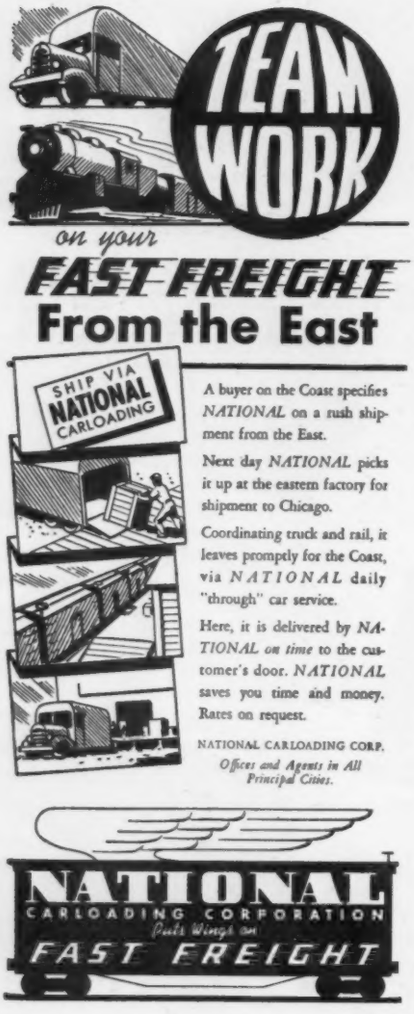
5 NEW SALES HELPS

New literature — colorful sales pieces that help win prospects — plenty of space for your local sales message — window and floor displays. See your distributor or Hotpoint representative.

EDISON GENERAL ELECTRIC APPLIANCE COMPANY, Inc., 5612 West Taylor Street, Chicago, Illinois

WATER Hotpoint HEATERS

ELECTRIC RANGES • REFRIGERATORS • WASHERS AND IRONERS • DISHWASHER-SINKS


TEAM WORK
on your
FAST FREIGHT
From the East
SHIP VIA NATIONAL CARLOADING
A buyer on the Coast specifies NATIONAL on a rush shipment from the East.
Next day NATIONAL picks it up at the eastern factory for shipment to Chicago.
Coordinating truck and rail, it leaves promptly for the Coast, via NATIONAL daily "through" car service.
Here, it is delivered by NATIONAL on time to the customer's door. NATIONAL saves you time and money. Rates on request.
NATIONAL CARLOADING CORP.
Offices and Agents in All Principal Cities.
NATIONAL
CARLOADING CORPORATION
Puts Wings on
FAST FREIGHT

Transformers (1029)

A new line of instrument transformers is described in a 12-page booklet issued by Westinghouse. All of these units offer insulation coordinated with A. S. A. standards. Two new current transformers, particularly suited for metering installations on networks, are featured. Ratings and specifications are given on all types of transformers included.

Demand Meters (1030)

Two new booklets by General Electric feature demand meters, recording types DG-1, DG-2, and BR-1. These 12 and 8-page publications completely cover this a. c., direct-driven and contact-operated equipment, which is strip-chart with universal front and back connected. Illustrations, charts and detailed information point out the qualities and features of this meter.

Building Wire (1031)

A NEMA report on the investigation of small diameter building wire has been recently published. The type of small-diameter building wire covered has a "heat-resistant" grade of rubber insulation capable of sustained operation at a temperature up to 75° C. (167° F.) The report covers an investigation carried on to obtain information concerning the permissible current carrying capacity of the new small wire under various installation conditions. Complete details and conclusions, including tables for current carrying capacity are given.

Speed Changes (1032)

Vari-Pitch Speed Changer units are discussed in a new 20-page Allis-Chalmers publication. Pictures and facts show how these units help in "Keying Production to Profits." Scores of installation views show how many industries are already applying the speed changer to provide right speeds for their needs. The bulletin also covers manual and electrical remote controlled units, dimension sheets, horse power and speed range tables.

Graphic Instruments (1033)

Graphic instruments and "turblator" oil circuit breakers are discussed in new bulletins by Roller-Smith Co. A general description and construction of the graphic instruments is presented, outlining electric mechanisms, giving prices of the various type AG alternating current units. Illustrations and diagrams describe the indoor type "turblators" in the other booklets.

Connectors (1034)

Connectors in copper and aluminum for cable, tube, wire, bar and rod are completely listed in a new catalog published by the Burndy Engineering Co., Inc. Hundreds of illustrations, supplemented with diagrams, facts, charts make this 64-page publication an outstanding reference piece.

Panels (1035)

Instrument panels and panel housings are described in a new bulletin issued by the Pacific Electric Mfg. Corp. These instruments are outlined, wiring conditions stated, and housing qualities given. Diagrams and a chart of sizes and overall dimensions are included.

NATIONAL ELECTRIC RATE BOOK, published by the Federal Power Commission. $15. Contains residential, commercial and industrial electric rate schedules of publicly and privately owned utilities in all communities of 1,000 population or more in the U. S. Size is 9⅛ in. x 11⅜ in. More than 1500 pages list 15,000 rate schedules in 10,000 communities. Rate books for individual states may be procured at varying prices, $1, $1.50 and $2.

INDUSTRIAL ELECTRICITY, Part 1 by Chester L. Dawes. McGraw-Hill, $2.20, available at 68 Post St., San Francisco. Purpose of the book: to give a bird's-eye view of electrical engineering to the beginner. Intended for individuals studying on their own, or as a text in technical and other schools below collegiate grade. The idea is to present sufficient theory and descriptive matter to give the beginning student an understanding of various phenomena he might encounter in industrial apparatus. The book runs 371 pages, is comprehensive, well illustrated.

1939 UTILITY CHARTS, compiled and published by Robert A. Burrows, First National Bank Bldg., Pittsburgh, Pa., $2 ($3 in color). Hours of poring through corporation directories and other sources, would not give many people a clear picture of the financial relationship of America's principal utilities. The utility chart does so at a glance. Covering data for 45 principal gas and electric systems, involving more than 400 companies, it shows: relations of voting stocks, capitalization, revenues, operating ratio, net income, share earnings, etc. Five service-area maps are included, and appropriate symbols indicate companies serving in competitive government power districts, and other information. The chart is conveniently indexed. Color is available, but clarity of the black and white charts is almost as good. Add 25c if unfolded mailing is desired.

SAVE TIME! USE THIS COUPON

To keep posted, simply circle the items in which you are interested, cut out the coupon (it can be pasted on the back of a postcard) and mail to:

ELECTRICAL WEST, 68 Post St., San Francisco, California
Please send me the following CIRCLED items:

1001	1002	1003	1004	1005	1006	1007	1008	1009	1010
1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
1021	1022	1023	1024	1025	1026	1027	1028	1029	1030
1031	1032	1033	1034	1035					

Name..... Title*.....

Company* .....

Address .....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

7 Reasons for Specifying KEARNEY Con-nec-tites

1 Wire sizes are clearly stamped on the heads of Con-Nec-Tites.

2 Hexagonal head fits securely into wrench and permits positive tightening.

3 Uniform slot widths are accurately checked to within limits of 3/1000ths of an inch.

4 Maximum pressure between conductors is obtained by clean threads and use of full-round washer.

5 Patented Full-Round Washer affords a smooth, low-friction bearing surface for the nut.

6 Uniform threads provide easy nut engagement; minimize nut friction and transmit most of exerted torque into direct pressure between conductors.

7 A thread "lead pilot" permits easy starting of nut onto bolt.

THERE ARE MORE THAN 75 STANDARD CON-NEC-TITES

For Better Maintenance and Construction—

Use KEARNEY PRODUCTS

EXCLUSIVE SALES REPRESENTATIVES **MAYDWELL & HARTZELL INCORPORATED**

LOS ANGELES • SAN FRANCISCO • PORTLAND • SEATTLE • PHOENIX • RENO • TACOMA • SPOKANE

WESTINGHOUSE LUMINAIRES BRING

VISIBILITY AT NIGHT

To Long Beach, California

SAFETY LIGHTING!

Long Beach, Cal., joins in the nationwide movement to reduce night traffic deaths. Westinghouse Reflectolux Sr. luminaires, 136 in all, now provide adequate visibility for automobile drivers on American Avenue. These asymmetric-type units use 10,000-lumen incandescent lamps.

EXPERIENCE PROVES REFLECTOLUX PRINCIPLE

Realizing that VISIBILITY AT NIGHT is a vital element in urban traffic safety, the City of Long Beach, Cal., has installed 136 Westinghouse Reflectolux Sr. luminaires on American Avenue. Thus, Long Beach joins the roll of American cities that have adopted adequate street lighting to save lives.

The first requirement of public safety is for a lighting system to halt the rise of nighttime traffic deaths. Reflectolux fulfills that requirement.

Glareless light from a concealed light source, high intensities of light from aluminum reflecting surfaces finished by the Alzak process and accurate symmetric or asymmetric light control . . . all of these features are available in Reflectolux luminaires by Westinghouse. Experience has proved that wherever installed on a carefully engineered basis, the Reflectolux principle is literally SAVING LIVES WITH LIGHT.

For complete details call your local Westinghouse Lighting Specialist; or address Westinghouse Electric & Mfg. Co., Lighting Division, Edgewater Park, Cleveland, O.

Westinghouse Reflectolux Sr.—Designed for Incandescent, Combination Mercury-Incandescent or Sodium Vapor Lamps.

Westinghouse Lighting Equipment

A Cost Comparison

SQUARE D MULTI-BREAKER VS SWITCH AND FUSES

Assume this cottage requires 2 branch circuits for lighting and appliances. Compare these costs.

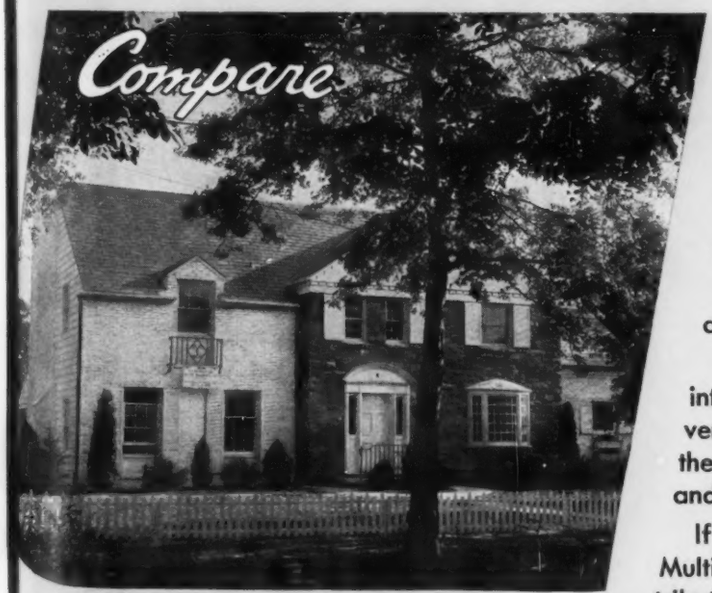
Dead front switch with fuses $2.90

MULTI-BREAKER $2.65

This size house probably will require 6 circuits, 3 for lighting and 1 each for appliances, range and water heater.

Cost of service distribution center with fuses $16.00

MULTI-BREAKER $13.50



A house of this size probably will require 5 lighting circuits, 1 appliance circuit, 1 range circuit and 1 separately metered water heater circuit.

Cost of service distribution center with fuses . . $18.60

MULTI-BREAKERS . . . $21.90

(Photo courtesy Wychwood Corp., Wychwood, Westfield, N. J.)

● If you think Square D Multi-breakeRs add to the cost of house wiring, read the comparative figures. Sometimes they cost less—sometimes a little more—but the difference is always negligible.

And look what you offer the home builder! Circuit breaker protection—branch circuit switching—no fuses with the expense and nuisance of replacing them!

Here is the kind of ammunition that gives you a real advantage over your "switch and fuse" competitors.

One other important point—the Multi-breakeR interests the home builder in better wiring, more convenience outlets, more electrical appliances. It lays the foundation for a bigger and better wiring job and more profits for you.

If you haven't the complete story of the Square D Multi-breakeR, get in touch with your Square D distributor or write for Bulletin CA-543.

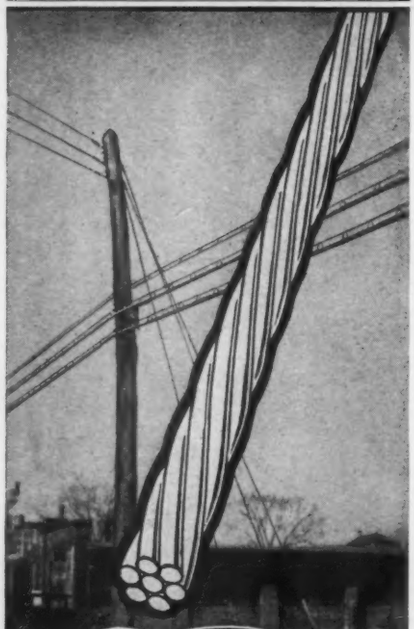
CALL IN A SQUARE D MAN

SQUARE D COMPANY

LOS ANGELES - MILWAUKEE - DETROIT

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

Crapo
GALVANIZED STEEL
STRAND
Guy and Messenger



ALL the STRENGTH and DURABILITY NEEDS DEMAND

The superior tensile strength that only steel can give . . . . the ruggedness to withstand severe punishment . . . . the ability to outlast normal needs . . . All these are combined—with outstanding economy—in Crapo Galvanized Guy and Messenger Strand.

Long life and low maintenance costs are characteristic of this time-tested product. Heavy, ductile, tightly-adherent zinc coatings, applied by the Crapo Process, provide lasting protection against corrosion. The inherent strength and endurance of the steel makes for dependable, maintenance-free service.

Crapo Galvanized Steel Strand is readily available in all standard grades and sizes from representative jobbers.

Crapo Galvanized Products also include Crapo HTC-130 and HTC-80 Steel Conductors (Solid and Stranded 3-Wire), Construction Wire, Tie Wire and Ground Wire.

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

LETTERS

Diplomatic Article

DEAR SIRS:

The August issue of Electrical West, p. 49, carries an article, "The EEI States Its Case." This subject has been quite a bone of contention with a considerable number of contractors, not altogether in the proposals as submitted by EEI but to some considerable extent in the manner in which it has been presented by Mr. Morton and the publicity matter emanating from EEI headquarters.

You are probably aware that at the Hot Springs, Va., NECA executive committee meeting Mr. Brand, now heading this particular activity, stated that they would destroy one of the publicity spreads that has aroused considerable resentment. Furthermore they were to take immediate steps to call a meeting of representatives of the other branches to discuss four points of the nine point code program they have developed. Four of the points they are willing to discard without more ado.

The phrasing of your article is quite diplomatic. If I had written it I would have gone far afield to bring to attention the harm that this program is bringing to them through elimination of the good will of other branches of the industry toward the utilities.

With this thought in mind I hope to see more and more such articles until an aroused industry will think, will cooperate and find a way to meet coming conditions.

S. G. HEPLER
NECA Executive Committeeman
Seattle, Wash.

Adequate Wiring Appreciated

DEAR SIRS:

. . . We have put out a very representative number of both wiring and kitchen plans but nearly all of them have been put out at the request of someone in our own organization. Some of the lumber companies are commencing to use our wiring plans because they find that a good many people really do appreciate adequate wiring.

. . . As was brought out at the conference at San Francisco a lot of wiring contractors are their own worst enemies, but we are making progress in raising the standards of wiring not only in residences but in commercial and industrial buildings. The activity should progress much faster because the National Adequate Wiring Conference in San Francisco showed plenty of evidences that there are a lot of people promoting adequacy in interior wiring.

J. CARL BALDRIDGE
Dealer Sales Manager
Idaho Power Co.
Boise, Idaho

Cooperative Spread

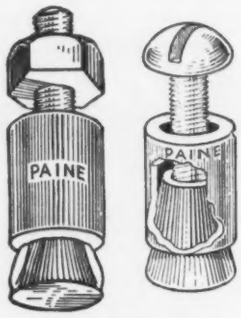
DEAR SIRS:

I certainly want to compliment you on the fine spread that you gave to the Woodside Hills home on page 39 of the September issue.

Is it possible for us to get about eight copies of this issue as we would like to see that our people in the East are fully informed of this fine cooperation.

A. B. MURPHY
Sales Development Manager
Merchandising Division
Westinghouse Elec. & Mfg. Co.

PAINE



LEAD ANCHORS FOR DEPENDABLE ANCHORAGE

● To insure dependable, permanently secure anchorage with maximum holding power, standardize on Paine Lead Anchors. Safest to use in fragile materials, yet very successfully applied in solids such as stone, concrete, marble brick tile, etc. Two types: Bolt and Nut Type (at left) and Machine Screw Type (right). Machine Screw Type has brass or steel cone. Easiest to use, most economical and efficient, Paine Lead Anchors are the best anchors for all anchorage problems.

Write for Complete Catalog!

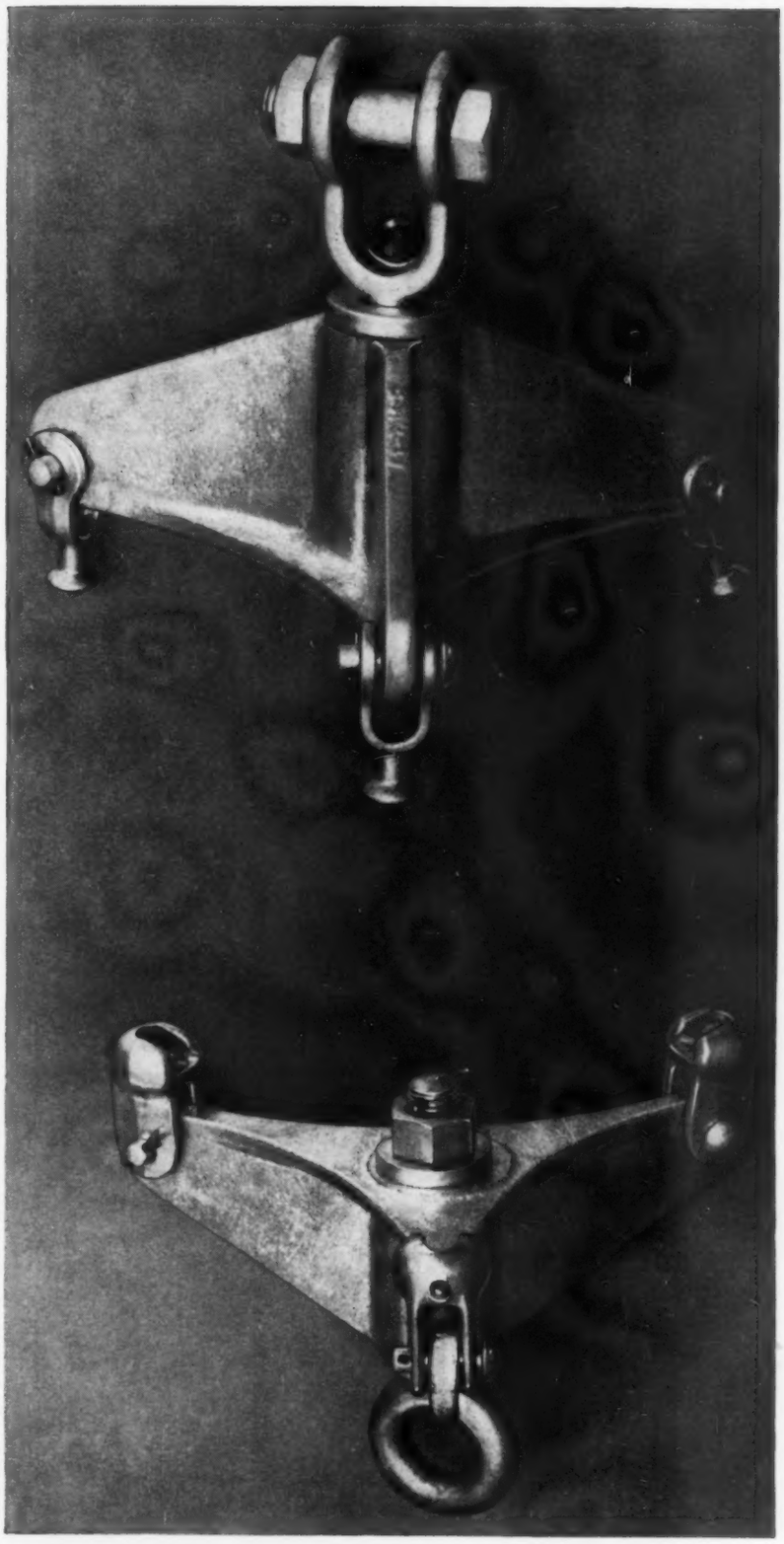
THE PAINE COMPANY
2975 Carroll Ave. Chicago, U.S.A.
WESTERN BRANCHES:
Seattle: 3006 Western Ave.
San Francisco: 486 Eighth St.
Los Angeles: 423 Moline St.

YOU SAVE With JEFFRIES

AIR COOLED TRANSFORMERS

● With a Jeffries Air Cooled Transformer money can be saved. The Air Cooled construction lengthens the life of the transformer and lowers repair costs. Plant expansion and extension can be made economically for a Jeffries Transformer provides the voltage change at the point desired without the need of long and expensive conduit runs. Besides a complete line of standard transformers, special designs and voltage furnished to order. Type S.S. Transformer 1 to 5 K.V.A. illustrated.

JEFFRIES TRANSFORMER COMPANY
5706 LONG BEACH AVE., LOS ANGELES



Once Again!

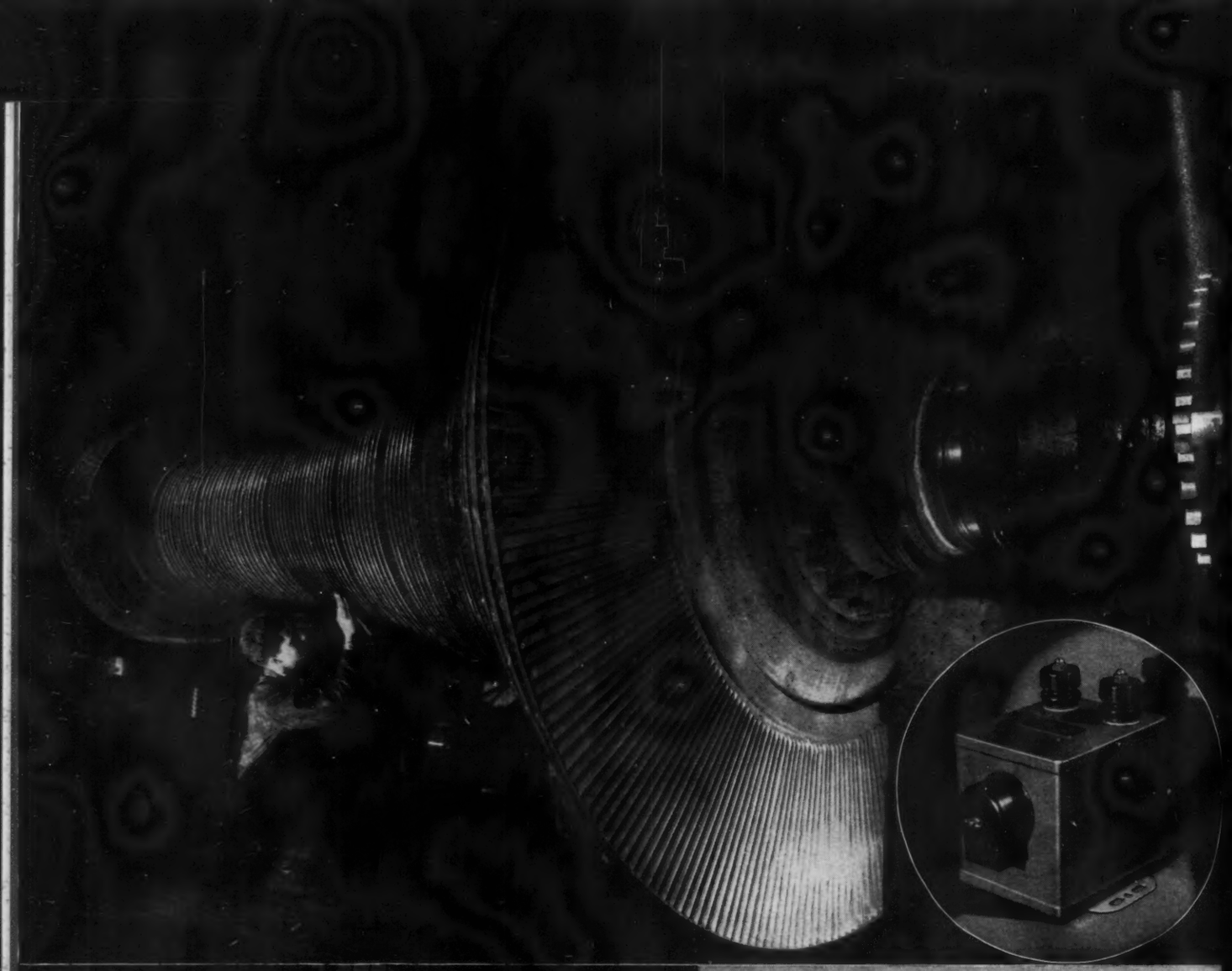
At the right we see a tripple yoke set that BTC has just finished for an important installation. We point to it for one reason. Each passing year shows the addition of new hardware —the solution of new problems in the hi-line hardware field. The house of BTC continues to expand and act as a clearing house for these problems: to supply the field with better hardware.

THE BREWER-TITCHENER CORP.
Cortland, New York

by BTC

High Tension Suspension Line Hardware

THE BREWER-TITCHENER CORPORATION



WHETHER IT'S A GIANT 30,000 HP steam turbine or a 50 va potential transformer, Allis-Chalmers' care and precision in design and workmanship are reflected by the outstanding service records of all equipment bearing the Allis-Chalmers nameplate.

SHIPPED PRE-TESTED AND COMPLETE-ly assembled, Allis-Chalmers Vertical-Lift Metal-Clad Switchgear is ready to go to work for you a short time after arrival. All you have to do is connect the leads and you're started on the road to low-cost, dependable protection for your equipment and your workers.

ALLIS-CHALMERS

MILWAUKEE · WISCONSIN

LOS ANGELES, CAL. ROWAN BUILDING

SEATTLE [illegible] HENRY [illegible]

SALT LAKE CITY, UTAH KEARNS BUILDING

SAN FRANCIS[illegible] [illegible]

PORTLAND, OREGON 1311 S. E. UNION AVE.

DENVER, CO[illegible] CONTINENTAL [illegible]

EL PASO, TEXAS, [illegible]

PRINT IN BINDING

0 HP
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SHORT CUT TO *Bigger Savings!*

"How well will it fit into my present system? How will it stand up? How much will it save me in actual dollars and cents?" Probably these are the first questions that arise in your mind when you're faced with the purchase of new equipment for your company.

And your best answer to these questions is the modern line of Allis-Chalmers equipment!

For the superior engineering that goes into every product of the Allis-Chalmers line is pointed to one goal—to give America's utilities the perfection they demand . . . the extra value features . . . the mechanical sturdiness that means longer life and less servicing in the equipment they buy.

That's why we say, "To specify Allis-Chalmers is the short cut to bigger savings!"

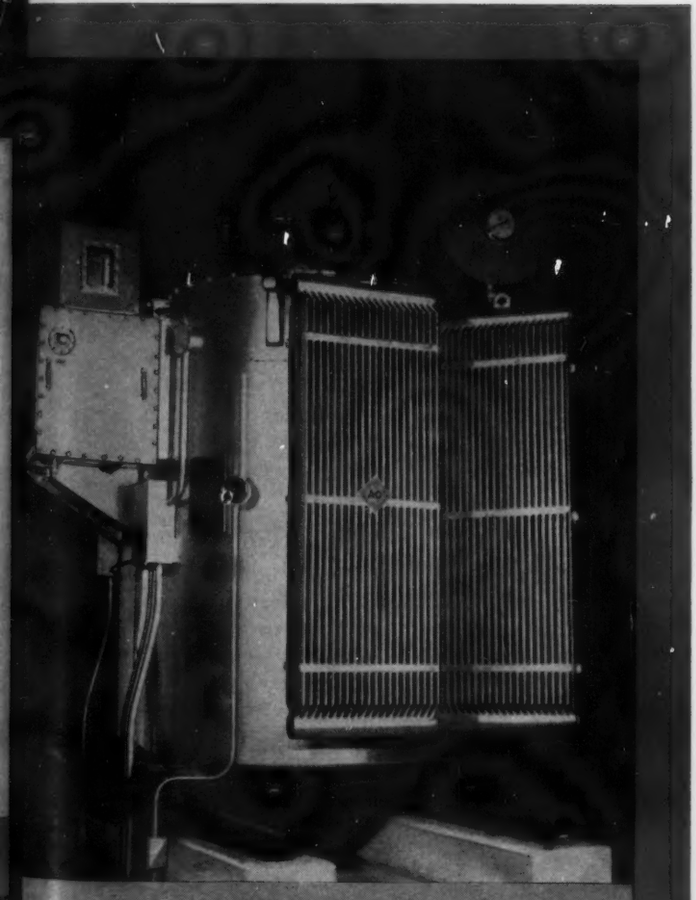
Since 1878, Allis-Chalmers has been working with the utility industry . . . not only keeping pace with changing trends . . . but in many cases actually leading the field!

Greater Dollar for Dollar Value for You!

Today the Allis-Chalmers line is still far ahead with new engineering features that mean greater dollar for dollar value than ever before!

The equipment on these pages is the equipment you specify and buy. Look it over! See how well it fits into your present operating system! Or, if you want to get the viewpoint of the engineer who specifies Allis-Chalmers . . . you won't have to go far to find an installation of our equipment.

Frankly . . . ask him what Allis-Chalmers superior engineering is doing for him. Then call the nearest district office . . . or write direct to Allis-Chalmers, Milwaukee . . . and find out what that superior engineering can do for you!



INTRODUCED BY ALLIS-CHALMERS IN 1933, step regulators are rapidly superseding older designs on systems throughout the country. This 5/8% Half-Cycling Step Feeder Voltage Regulator keeps operating costs low while maintaining constant voltage for a midwestern utility.

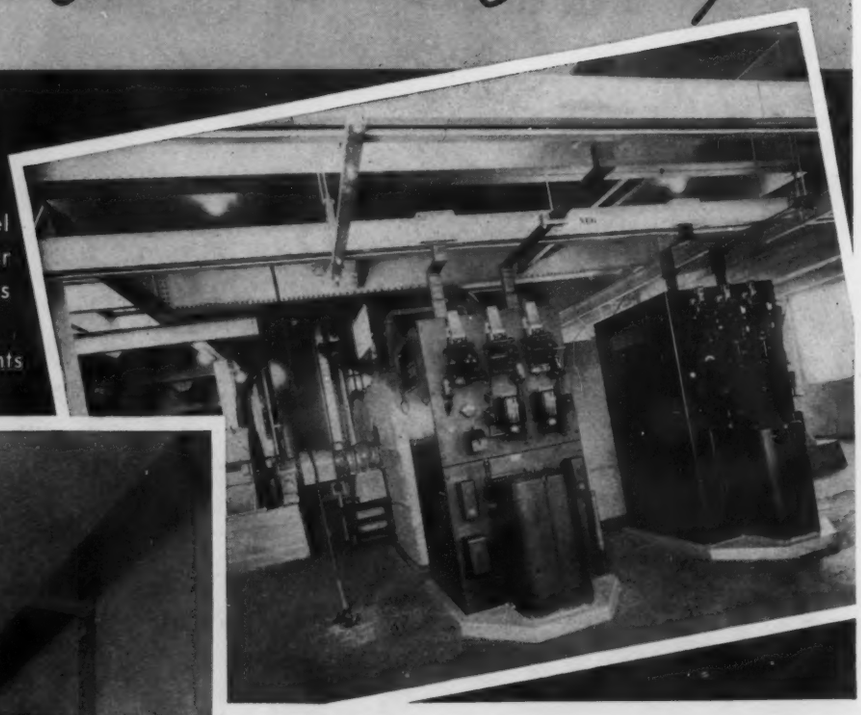
A-1127

WHAT A COMBINATION OF DESIRABLE PROPERTIES!

Aluminum Bus Bars and Housings

ALCOA

Alcoa Aluminum Channel Bus Bars Supply Power to Station Auxiliaries



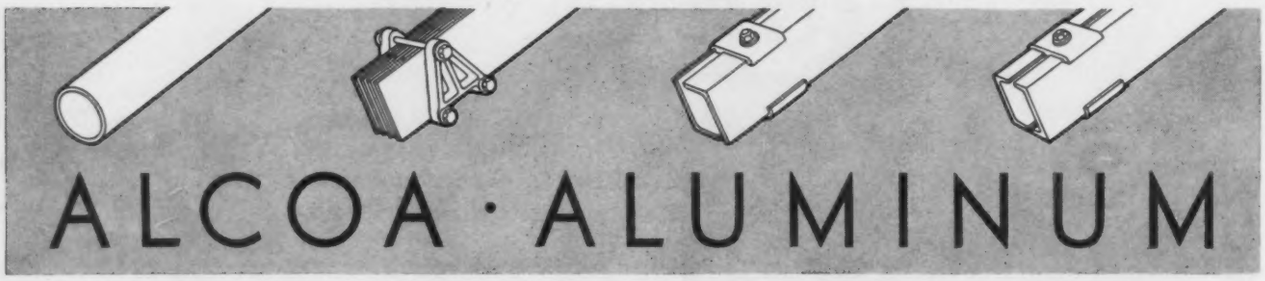
These Aluminum Compartments House 24,000-volt Buses

Ask our engineers for assistance on your bus bar and enclosure problems. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Bldg., Pittsburgh, Pa.

The Detroit Edison Company employs Aluminum enclosures for the high current buses and switching apparatus at Essex Switching Station and the Conners Creek plant. Because it is non-magnetic, Aluminum avoids the heating effect of magnetic materials under similar conditions. Equipment housed in Aluminum carries heavier loads without overheating.

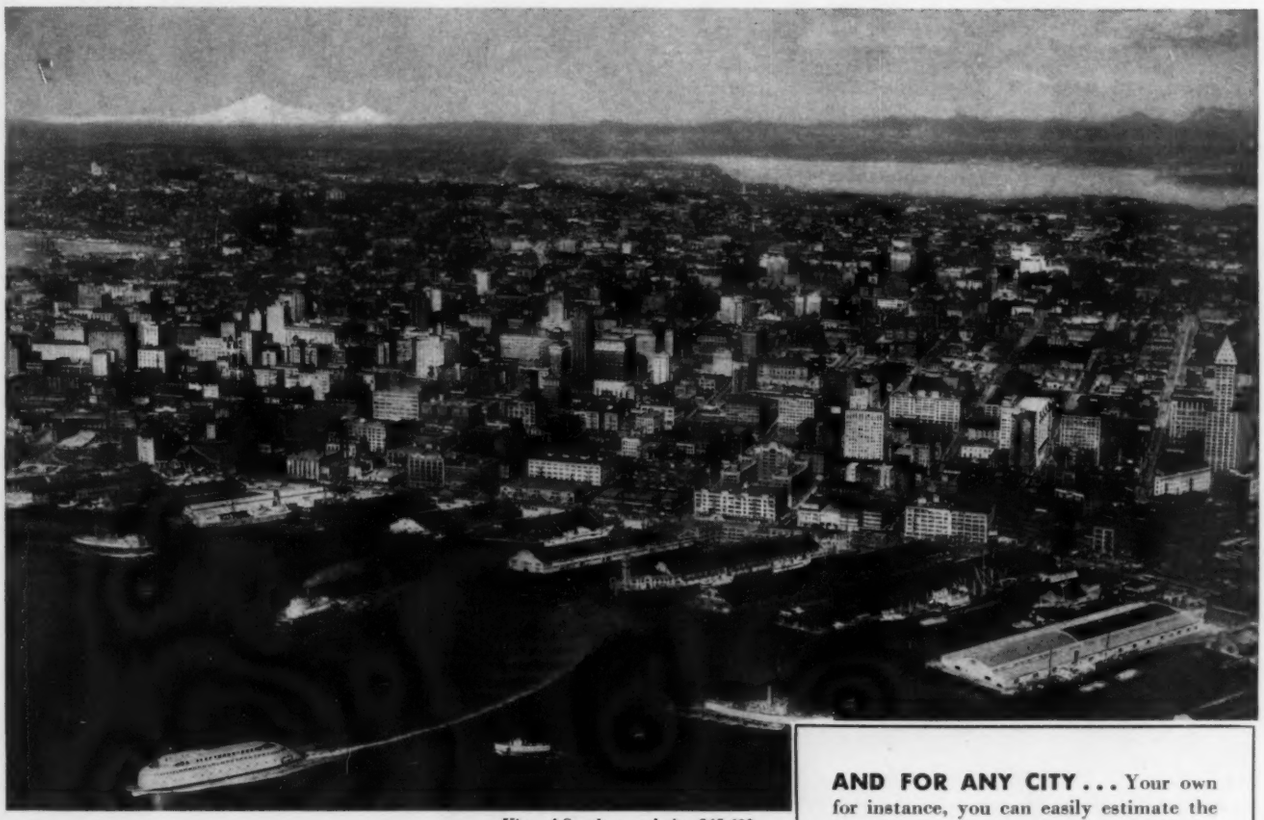
Some bus bars at these stations are likewise Alcoa Aluminum. They provide high electrical conductivity, are light in weight and highly resistant to corrosion.

Aluminum housings and bus bars are easily fabricated from standard structural materials, purchased from stock. Aluminum construction is strong and neat, and needs no protective coating of paint. Its lighter weight places less burden on supporting structures, thereby simplifying construction and reducing costs.



ALCOA · ALUMINUM

Selling lamps and lighting in SEATTLE, WASHINGTON



View of Seattle, population 365,600

HERE'S the way General Electric advertising is constantly at work in Seattle, promoting light-conditioning for Better Light-Better Sight. Into Seattle homes every week goes a steady stream of G-E lamp and lighting advertisements amounting to 65 impressions per person in the last ten years.

IN 1939 . . . 1,890,000 magazines with G-E lamp advertisements and 635,000 radio messages.

SINCE 1929 . . . 19,940,000 magazines with G-E lamp advertisements.

SINCE 1936 . . . 1,540,000 copies of Seattle newspapers with G-E lamp advertisements.

SINCE 1929 . . . 24,020,000 advertisements in magazines, newspapers, and radio . . . which is approximately 65 advertisements per capita.

AND FOR ANY CITY . . . Your own for instance, you can easily estimate the approximate number of lamp and lighting advertisements General Electric is delivering to your customers by applying the following national averages:

Going into the average wired home in 1939 . . .

14 magazines with G-E lamp ads
5 newspapers with G-E lamp ads
5 radio messages
24 total advertising messages

• • •

In the last 10 years, the average wired home received . . .

158 magazines with G-E lamp ads
30 newspapers with G-E lamp ads
20 radio messages
208 total advertising messages

G-E MAZDA LAMPS
GENERAL ELECTRIC

From Telephone Cables to

VARNISHED CAMBRIC POWER CABLES

OVER 60 TYPES OF ROEBLING (JAR) ELECTRICAL WIRES AND CABLES

Rubber Covered Wires and Cables: Code; Performance; and Heat Resisting; Plain Rubber 60% sheath Power Cable and 40% and 60% sheath Flexible Cords

Power Cables: Paper; Cambric; Rubber

Parkway Cable, metallic and non-metallic

Service Entrance Cable

Slow-Burning Wires and Cable

Weatherproof Wires and Cable

Police-Fire Alarm Cable

Appliance Cords

Annunciator and Blasting Wire

Network Cables

Magnet Wire

Welding Cables

And a wide variety of other wires and cables; either Standard or to Customer's Specifications

QUICK SHIPMENT

Prompt Service is available at all offices and warehouse points listed below, where large stocks of a wide variety of standard Roebling Wires and Cables are always on hand. Your request for information, prices or samples will be welcomed.

JOHN A. ROEBLING'S SONS CO. OF CALIF.
San Francisco, Los Angeles, Seattle, Portland

IF IT'S ELECTRICAL WIRE OR CABLE **ROEBLING** I HAS IT!

An Oil Cushion for the WORLD'S MIGHTIEST MARINE REDUCTION GEARS!

THE DRIVING POWER of the new 36,000-ton *Mauretania's* great turbines is transferred to the twin propellers through two 85-ton reduction gears.

These gears—the largest marine-turbine reduction gears in the world—must mesh smoothly, run quietly and last through long years of service.

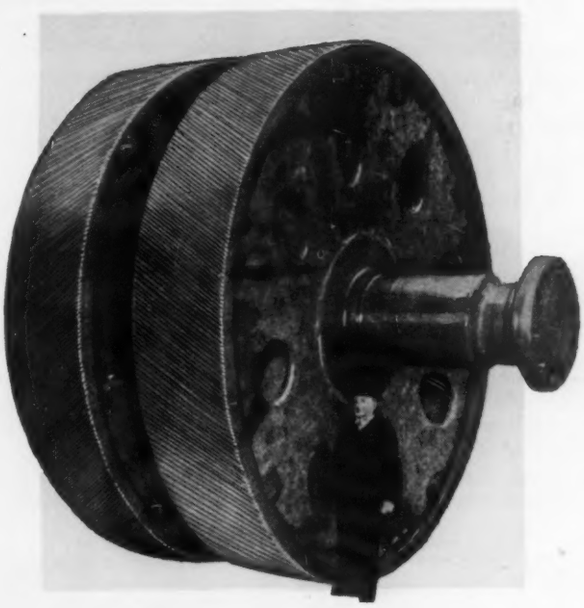
These giant gears—and the huge turbines that drive them—require lubricants that will give perfect performance under all conditions—and Cunard White Star called on Shell to furnish just such lubricants.

When this magnificent new ship sailed on her maiden voyage, Cunard White Star felt sure—because of Shell's wide experience in marine lubrication—that they had made a sound decision in choosing Shell Lubricants for this important job.

• • •

Whether it's a problem of lubricating a great stationary power plant—or a ship—or a single bearing—Shell is prepared with the right lubricant for every use.

No matter what *your* lubrication problem—large or small—you'll find Shell fully equipped to handle it. Why not call in the local Shell man today? Or write to the Industrial Lubricants Division, Shell Building, San Francisco, California.



THE NEW *MAURETANIA* is a twin-screw liner driven by single reduction-geared turbines. The two main reduction gears—one of which is illustrated above—are the largest ever constructed for a liner and weigh 85 tons each. The two propellers are also remarkable for a ship of her size, the weight of each being 25 tons.

SHELL INDUSTRIAL LUBRICANTS

SHELL

ELECTRA'S HUSBAND

Sherman Was Right

"PUT that magazine away and talk to me," Electra barked in a tone of exasperation. "All you do is read, read, read. Anyone would think that I was just the hired girl around this house for all of the consideration I get of an evening. If it isn't a magazine, it's 'Grapes of Wrath' or worse still, the radio bleating about the war."

"Now honey, don't let this heat get you down," I said soothingly. "Six days of a hundred or more in the shade shouldn't bother you after part of a summer spent in the East. Besides I happen to be reading about the war—what it might do to my job if we get in it. I brought home this copy of a British electrical magazine from the library just for that purpose. Over there things are not so good. Everything has to do with air raid precautions."

"Yes, but that won't happen here," Electra commented. "Suppose we do go to war, what's going to happen to your light and power industry?"

"Well, that's a matter of opinion. Some think that the New Deal hotheads will socialize it just like the government did with the railroads in the last war. And the railroads are still suffering from that bitter experience. Others think that everyone will be too busy to do anything but produce essential goods. If the latter happens to be so, then nothing much of anything will happen, except that more electricity than ever before will be demanded and used.

"Now if this country were to be attacked, that would be something else again. If we were as close to a potential enemy as most of the British Isles are to German airports, I guess we would have to inaugurate some of the precautionary measures such as are being adopted over there."

"What do you mean precautionary measures?" Electra asked. "Aren't people living and working just like they always did?"

"No, my dear lady they are not. Take a look at some of these ads. A.R.P. warning signals. Blackout control systems. Special blue and black lamps. A.R.P. bombproof shelters. Emergency lighting systems. Special lighting fixtures for homes, offices, stores and factories. Fluorescent painted control equipment for use with ultra violet lamps. I tell you this is nice reading. The last war was just a Sunday school picnic compared to what this one is likely to be."

"What is that picture of those fellows decked out like the Tin Man in 'The Wizard of Oz'?" Electra asked as she pointed to a picture from the vantage point she had taken on the arm of my chair.

"Those? Why that's a decontamination squad in one of the big power houses dressed up in the gear necessary for a mop up job after a bomb raid. Those clothes are gas-proof. See where each man has a gas mask around his neck.

"Every power station, every industrial plant has a specially organized squad which will function in case of bombing. They'll be the first to come out of the bombproof shelters. And do you know that many of the plants have been camouflaged? They've been painted in all sorts of designs in an effort to fool enemy bombers. They have piled sandbags around everything, in fact there's an actual shortage of bags. I read where some of the lingerie makers had gone into the business of making sacks in order to meet the demand. I wonder what the women will do now? Funny what a war will do to upset even the most ordinary routines.

"Here's a piece about lighting. Government Air Raid Precaution regulations specify that the maximum outdoor lighting intensity cannot exceed 0.002 of a foot-candle. No light source can be visible. All reflecting surfaces must be painted over."

"Don't read me that technical jargon," Electra said. "What does it mean in plain English?"

"Well, 0.002 of a foot-candle is about one-tenth as bright as moonlight," I replied. "You couldn't even see a black cat in a dark alley in that light. And here's something else — rationing of electricity. No customer can use more than 75 per cent of the amount of electricity he used in previous months. Homes are limited to 200 kw.-hr. a year unless they have an electric range and no other means of cooking. Then by special permission they can use 1,000 kw.-hr. They've rationed coal and gas as well. See this piece about special lights for the home. Here's a 'Moonbeam' bedroom lamp and dark lamp shields."

"Do you think we'll get into the fight?" Electra inquired.

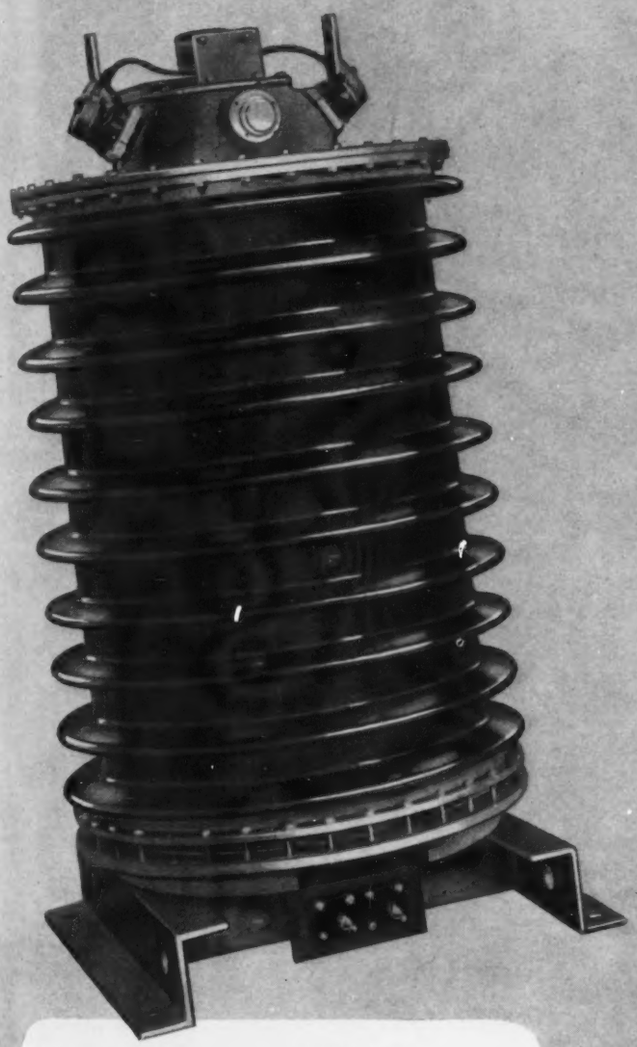
"Yes, if it lasts more than six months," I answered. "Why do you ask?"

"Because I'm thinking about becoming an isolationist. Sherman didn't know the half of it when he said what he did. War today is worse than that."

AIR RAID WARNING
FOR FACTORIES AND PUBLIC BUILDING
"Secomak" Electric Syrens—The Efficient—Economical Sound Signals for all purposes.
Service Electric Co., Ltd.
122 Pratt Street, London, N.W.1.

Simplify Substation Construction

with *NEW* PORCELAIN-CASE CURRENT TRANSFORMER



Type OPC
CURRENT TRANSFORMER
Ratings up to 1000 amperes
25,000 to 161,000 volts

Smaller, Lighter, yet MORE ACCURATE

Substation layout and appearance can both be improved by using the new Westinghouse OPC Current Transformer.

The OPC (138 kw. class), is only half as high as the older type and weighs only 2400 pounds. This saving in size and weight is made possible by an all-porcelain case. Bushing and case are combined in one unit—no need for awkwardly large bushings or large coil-to-tank clearances. The porcelain itself is its own insulator.

Yet this transformer for high-voltage metering sacrifices nothing in performance and accuracy. Its NEMA accuracy rating is: X-¼, Y-¼, Z-¼ and at either X, Y or Z burden, accuracy at 20 times normal current is within 5%.

For indoor use or hazardous locations, the tank may be filled with non-inflammable Inerteen in place of oil, making transformer explosion-proof and fireproof.

CHECK THESE ADVANTAGES OF THE NEW OPC

- Smaller size, lighter weight.
- Excellent accuracy.
- Can use either Inerteen or oil.
- Insulation fully coordinated with ASA standards.

J-70200

Westinghouse Transformers

.000002 ampere power plants...

...for this ultra-sensitive WESTON relay

WESTON Model 705 Sensitrol

The most sensitive direct acting relay known handling 5 watts at 110 volts on its magnetic contacts... operates direct from photocells, thermocouples, resistance bulbs and electronic circuits... fixed or adjustable contacts ..., provides positive control at energy levels as low as 1 millivolt or 2 microamperes... made in hand reset and solenoid reset types.

OTHER WESTON RELAYS

SENSITIVE RELAYS (Model 30) Permanent magnet, movable coil operation ... for circuits up to 200 milliamperes, 6 volts, DC... in types for "high-low" voltage (or current) control, and for regulation of voltage (or current) within 1%. Also "microampere" type, operating from high-side to low-side at a minimum differential of 15 microamperes.

SENSITIVE RELAYS (Model 534) Compact, permanent magnet, movable coil operation... for circuits up to 200 milliamperes, 6 volts, DC... for surface or flush mounting in current relay, voltage relay or "microampere" types.

TIME DELAY RELAYS (Model 613) Compensated bi-metal operation... single or double circuit... provides time delay of 15 seconds to 1 minute between initial impulse and operation... handles up to 25 watts at 110-volts output.

SENSITIVE INDICATING RELAYS (Model 730) Designed specifically for alarm circuit use where current is normally held at 2 milliamperes... standard model serves as indicator over 0-4 milliampere range, with contacts at 1 and 3 milliamperes... compact and inexpensive.

POWER RELAYS (Model 630) Electro-magnetic type with one to four mercury switch contacts... designed particularly for use with sensitive relays to supply output energy up to 1000 watts... operate on 6 volts DC, or from transformer rectifier unit.

Even though there is only a bare 2 microamperes of energy available, WESTON Sensitrol Relays, with indicating scales, can put it to work as a means of positive control. Similarly, if high speed high output or some other critical element is the limiting factor, there are other WESTON relays which exactly meet each requirement. » » » Whether your problem involves the application of sensitive relays to new products, or for existing circuits, the same WESTON engineers responsible for the widespread use of such relays as a means of dependable and flexible electrical control, are still at your service. Their counsel may bring to light many new possibilities. Feel free to call on them for assistance, or, write for the WESTON Relay Catalog. Weston Electrical Instrument Corp., 577 Frelinghuysen Ave., Newark, N. J.

WESTON *Instruments*

WESTERN REPRESENTATIVES

Seattle, Wash.
Eicher & Bratt,
263 Colman Bldg.

San Francisco, Calif.
Herman E. Held,
420 Market St.

Los Angeles, Calif.
A. A. Barbera,
Subway Terminal Bldg.

Denver, Colo.
J. W. Van De Grift,
623 Charles Bldg.

Phoenix, Ariz.
J. E. Redmond Co.,
448 W. Madison St.

There are more than a thousand meters on life test in this room. They are being tested at light loads, heavy loads, variable loads, and at high speeds with weighted disks. Meters are also being tested in many other ways, such as: out of doors, in hot rooms, in cold rooms, in dry and in moisture-laden atmospheres.

100 YEARS OLD?

NO—these watthour meters are not 100 years old! But some have run on life tests at speeds so far above normal for such long periods of time that their operation is equivalent to 100 years of actual service.

One meter, for example, has made 130,000,000 revolutions. Based on metering an average annual domestic consumption of 800 kilowatt hours, that particular meter would be more than a century old.

In General Electric meter laboratories there are always in progress thousands of accelerated-life tests that simulate service conditions.

What are some of the improvements resulting from these tests?

The oil-tight jewel screw, G-E meter oil, the cobalt-tungsten pivot—these have greatly increased bearing life. Experiments are still being carried on, and additional improvements will soon be forthcoming.

Life tests are also made to check the permanence of magnets, to give assurance that new designs will result in unimpaired, long-time meter accuracy. Life tests have guided the design and proved the reliability of other parts, such as the register, top bearing, cover rings, and terminal blocks.

Such tests as these are actually but a few of the many studies that enter into the design and manufacture of watthour meters. But they serve to illustrate the care that is taken to assure the continual improvement of G-E meters. General Electric, Schenectady, New York.

AN INVITATION

If you're interested in life tests, or in any other phase of meter design and manufacture, why not visit our meter factory at West Lynn, Mass.? You are cordially invited. Take a day or more if you can; but if you've only an hour, come just the same.

1889 1939

Fifty Years of Meter Progress

HEADQUARTERS FOR ELECTRICAL MEASUREMENT

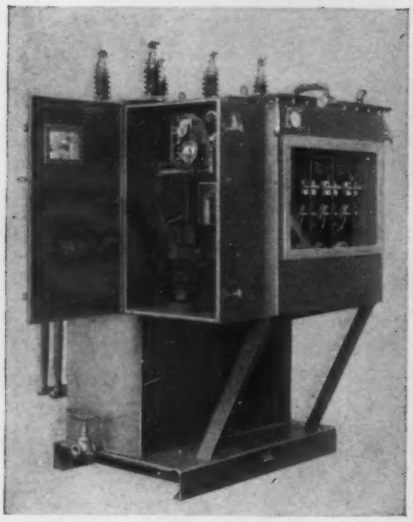
GENERAL ELECTRIC

400-38

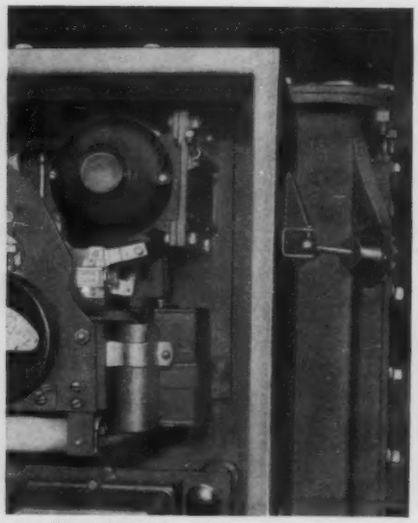
"So the Boss Called Me In"

"Listen," he said. "What's all this enthusiasm among you service men for the G-E step regulator? Why the G-E particularly?"

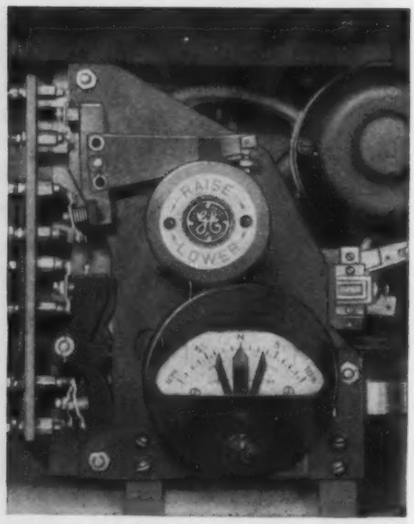
"Well, there are quite a few reasons," I answered. "For instance:



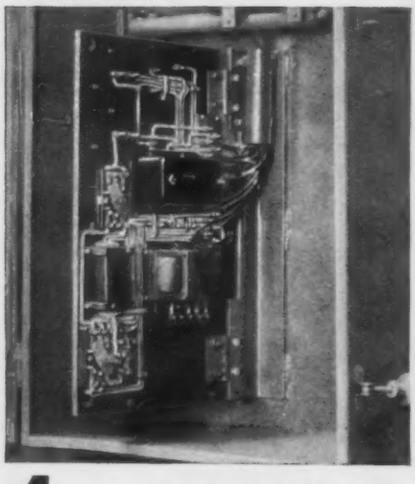
1 "I save a lot of time in making adjustments and inspections, because the control cabinet is located at just the right height. The switching mechanism is easy to get at, because there are removable plates on both the top and the side of the housing.



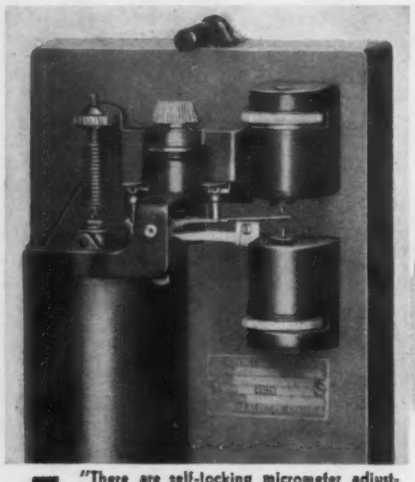
2 "And the switching-mechanism motor is located right in the control cabinet—not submerged in oil. You know what that means in time saved on routine inspections and servicing.



3 "I don't have to fuss and fume over manual operation—just turn the permanent handwheel near the position indicator in the control cabinet.



4 "It's no trick at all to inspect the control wiring; it's on a hinged panel that swings out from the back of the control cabinet.



5 "There are self-locking micrometer adjustments on the voltmeter. They make it easy to do an accurate job of setting the mean voltage level and the width of the voltage band."

Many power companies have found G-E 3-phase step-voltage regulators a low-cost way to improve voltage conditions on circuits of 6600 volts and higher. Bulletin GEA-1577D will tell you all about these regulators. Address General Electric Co., Schenectady, New York.

GENERAL ELECTRIC

350-147

"Bonneville Into Its Proper Place"

An interview with Dr. Paul J. Raver, Bonneville Administrator, on basic policies of his administration

"WHEN I was appointed Bonneville administrator by the Secretary of the Interior, and incidentally my first acquaintanceship with Mr. Ickes was on the occasion of my conferring with him about this appointment, I determined that I should approach the problem of how Bonneville power should be marketed from an objective and scientific standpoint. I have sought the assistance of two of the best consulting engineers that I could find in the country in the field of power marketing, and have asked these gentlemen to make a thorough study and market analysis of the Pacific Northwest region to form the basis of a sound policy for the present and future development of the Bonneville project. These gentlemen are James I. Metcalf, consulting power economist of the city of New York, who is in Portland now, and S. E. Schultz, chief electrical engineer of the Port of New York Authority, who will come to Portland soon. These men made a similar study for New York state in connection with the St. Lawrence River power development. They have also made a survey of the T.V.A. area to determine the future market for that power.

Here they are to look into the problem of the proper coordination of Bonneville with both public and privately-owned power plants with their eyes on a long range program for the development of the Columbia Basin as a whole with Bonneville as an important unit in that development. They will work with the present staff and will utilize all existing studies. From their study we expect to formulate a basic plan for selling this power now and as it develops in the future, in the manner best calculated to accomplish what the Bonneville Act contemplates, i.e., to bring the benefits of this low cost power to ultimate consumers.

I am also studying rates, both wholesale and resale, and again have sought consulting advice from one of the leading rate experts in the country, E. W. Morehouse, director of rates and research of the Public Service Commission of Wisconsin. Dr. Morehouse has already spent 10 days in Portland, and we hope to get him back for another two week period to complete his study."

DR. PAUL J. RAVER,

new administrator for Bonneville, arrived in Portland, Ore., Sept. 16, 1939. On that morning he held a press conference at which ELECTRICAL WEST was represented. His remarks to the representatives of the press on that occasion, both the statements he volunteered and the answers to the questions propounded to him, have been made the basis of this statement which Dr. Raver has checked and approved

Pending Contracts—(In answer to a direct question.) — "I know there are contracts for Bonneville power pending both with public and private agencies. I understand these contracts are in the negotiation stage. I have not seen them. When I do look into them, I shall be concerned about their provisions to see that the benefits of Bonneville power are passed on."

Rates—(In answer to a direct question as to the application of the T.V.A. type of rate in the Northwest.)—"There is a great deal to be said for the T.V.A. type of contract. In the case of selling to private utilities, we must remember that we have to deal with the state commissions that have jurisdiction over the rates and service of these utilities. In the case of selling to publicly owned projects, we are studying this problem. There are a number of successful public power projects in operation in this territory now. We do not expect to dictate to these. Our purpose will be to help them succeed rather than to try to dictate what their retail rates shall be.

But in order to protect the ultimate consumers and see that they get all the benefits to come from the Bonneville project, I feel that there should be clauses in our wholesale contract having to do with resale rates, and we will try to work this out with the communities with which we are dealing. The concern of the Administrator regarding this point is practically demanded by the Bonneville Act. In the case of contracts with private companies we will see what can be worked out with the companies and with the state commissions.

"Pre-sale schedules are being given careful study. *(In answer to direct question as to whether the schedules would be uniformly applied throughout the territory.)* There probably will be certain flexibility in the schedules that will permit some variation in different parts of the territory, depending on local conditions."

Comparison with T.V.A.—(In answer to direct question as to whether Dr. Raver foresaw a repetition of the T.V.A. type of development in this region.)—"I do not know what the ultimate outcome may be. This is not our immediate concern anyway. The immediate problem is not whether this development should be 100 per cent private, or 100 per cent public, or a combination of both. Bonneville is vital to the development of the whole Columbia River Basin, and we need a better understanding by all parties as to the precise place it shall occupy in this development. We want to fit Bonneville into its proper place with due regard for the aims and ambitions of the people of the Pacific Northwest, and this can be done if we have a common understanding."

Interconnection With Existing Systems—(In answer to direct question.)—"This will be a part of the study of Messrs. Metcalf and Schultz. There is much to be said in favor of power pooling as an economic proposition. Bonneville will be made to fit into the economic development of the Pacific Northwest. It supplements and implements existing power facilities and this may involve inter-connection at some points, or it may be found that Bonneville should be left largely independent.

"I don't want to use Bonneville to destroy any existing legitimate private investments."

Sale to Industries—(In answer to direct question.)—"I am hopeful at the prospect of encouraging new industries to come to this area. I am in contact with very definite possibilities.

"The development of new industry belongs in any long-time power policy. Bonneville is adding to and supplementing existing facilities to take care of new load and new industries."

Cooperation with R.E.A.—(In answer to direct question.)—"Indeed we will cooperate with the R.E.A. I have already approached that agency to learn what its problems in this territory are.

"In Illinois we worked closely with the R.E.A. and succeeded in making the state an outstanding one in rural electrification. But we had to develop an understanding as to what the problem was, and we had to have some intellectual honesty on both sides in dealing with the problem. Both the private companies and the R.E.A. cooperatives took part in the solution of this problem. Incidentally, I do not believe that Illinois has any monopoly on intellectual honesty. I think we may hope that this attitude will characterize the solution of the problems facing government power in the Pacific Northwest.

Cooperation with PUD's- (In answer to direct question.)—"I understand the PUD's in this area had considerable development during the regime of J. D. Ross. The Bonneville administration will aid and assist them. *(Question- As an advocate?)* - No. I do not expect to get out on the stump for them, but I do expect to give them every help through furnishing them information and advice, and this applies both to those now in existence and those that want to form. Public ownership has a definite place in the picture."

(In answer to direct question as to the manner in which PUD's should acquire their distribution systems.) - "This seems to me to be a matter for local determination and not a problem of the Bonneville administration. Personally I think they should avoid, if possible, duplication of facilities. I realize this problem presents both legal and engineering complexities. I do not conceive it to be a function of the Bonneville administration, under the Act, to fight their battles. But let me make myself clear—we do expect to give them all the help we can."

Portland General Electric Co. Contract- (In answer to direct question.)- "We are going to study all these pending contracts, including those with public agencies. I want to proceed slowly and know that when contracts are made they will insure the stability and growth of the Bonneville project and of the Columbia River Basin, rather than to jump in and take business just because it is available without knowing if that business will help the growth of Bonneville or stifle that growth. That is one reason for this market survey. I am trying to make an intelligent approach to the situation, and that is why I am not prepared yet to say definitely what will be done about this and other pending contracts. (In answer to direct question.)- Any statement you may have seen that this contract, or any other contract, is about to be concluded did not come from me."

Administrative Personnel- (In answer to direct question.) - "It is too early for me to talk about my personnel. You realize I have not taken over the office yet and will not till Monday. I am given to understand we have a good staff."

Electra's Husband's Reaction to Raver

"IT'S a pleasure to talk to a public official who can say 'yes' and 'no', who gives you a direct answer to a leading question with little qualification, who expresses himself clearly, who avoids circumlocution, and who doesn't employ the red herring method of diverting you from a hot trail."

"What's all this outburst about?" asked Electra.

"Well, I've just come from Dr. Paul Raver's press conference—you know, the Bonneville administrator—and I couldn't help contrasting this method with that of his well-known predecessor, J. D. Ross."

"I thought you liked J. D."

"I did in a way. Practically everybody who came in contact with him did. But I could never get anywhere with him. In the 15 years I knew him I never felt that we came within a mile of having a meeting of minds. I don't believe he ever really tried to make clear to me just what was in his mind and why. I always had the feeling that his evasions, his indirections and his circumlocutions were designed to obscure the issue rather than clarify it. I don't think it was entirely because he mistrusted me, because he acted the same way toward better men than I, and time and again I have seen him employ the same evasive tactics from the public platform.

"Dr. Raver on the other hand impressed me as having a sincere desire to impart to his hearers what was actually in his mind. He was direct, concise, positive and clear. He neither evaded nor hedged, and, believe me, the gentlemen of the press asked him some pointed questions. They knew that Ross had left Bonneville policies unsettled to say the least, and they wanted to learn how the new administrator would settle them."

"Did they find out?"

"Not specifically and in detail. They could scarcely expect that; he hadn't taken office yet. But they got some clearly expressed fundamental principles on which he would approach settlement. They found a man bent on learning first the nature of the problem that faced him through consulting engineering advice—the scientific—the intelligent approach, it seems to me."

"Wasn't Ross an engineer?"

"My dear Electra, I have told you before Ross was a super-salesman. He was determined to sell government ownership of electric utilities to the United States, regardless of whether Bonneville was successful or not—not because the people wanted it, because Ross wanted it.

"Raver said, and I believed him because his manner inspired confidence, that he wanted to fit Bonneville properly into the economic development of the entire region *with due regard for the aims and ambitions of the people of the region,* whether this would ultimately lead to 100 per cent government ownership or 100 per cent private ownership, or a combination of both."

"Then you think there is some hope for the utility industry?"

"Electra, my dear, I have never doubted this, because I do not believe any preponderance of the people of the Northwest want government ownership. But I am no prophet. Let's go to the ball game."

Consider the Electric Range

Specification Standards for Home Electric Ranges Developed By Los Angeles Bureau of Power & Light

By Burdett Moody

MOODY

THROUGH a close contact consequent upon its policy of practice of installation, servicing and maintenance of major electric appliances, the Los Angeles Bureau of Power & Light, as early as 1936, recognized a definite need for a number of improvements in the structure and performance of electric ranges.

Underlying Reasons

There existed at that time no generally accepted engineering standard for the design of ranges structurally, nor was there any definite procedure for true comparative determination of cooking performance. Because of this, ranges which were in common use gave rise to servicing and installation costs which were considered unduly excessive. Replacements of defective equipment and parts not only constituted considerable expense to the Bureau as well as loss to the electrical dealer, but likewise entailed considerable dissatisfaction from the standpoint of the consumer.

As a step towards remedying recognized shortcomings, a set of proposed specifications was formulated by the Bureau and circulated throughout the range manufacturing industry, for consideration and comment, during the early part of 1937. In establishing tentative requirements there was, and has been no desire on the part of the Bureau's management to enter strictly into the design of ranges, nor to dictate practice to be followed by manufacturers. On the other hand, it is important to note that as a cooperative gesture looking toward development of desirable range saturation, the Bureau's policy of providing for necessary wiring and assuming responsibility for installation and servicing of equipment involves an average outlay of approximately $50 per customer. In order that such expenditure may be adequately protected, the Bureau is therefore naturally solicitous of assuring the most satisfactory range operation possible as well as the lowest practicable servicing and maintenance costs so that no ground shall be lost through dissatisfaction of consumers.

Effective Date

Specifications were prepared in final form and were issued to manufacturers about the middle of 1938. As issued, the specifications were made to become effective for new range production on and after Jan. 1, 1939. The specifications covered some 85 separate points in which Structural Features and Electrical Features involved some 35 items each. No specification was written which could not be practicably met, and in every instance requirements were based upon definite needs indicated by experience. While it is, of course, impossible to discuss all points herein, it may be well to mention at least some of the more important elements.

Structural Considerations

From a structural point of view one matter which was most forcibly brought to the attention of the Bureau was the comparatively general practice throughout the electric range industry of furnishing ovens which were not of sufficient size to meet practical requirements. This lack of size, particularly with respect to height, had been a source of considerable unfavorable comment, not to speak of annoyance on the part of electric range users.

Through its servicing and maintenance organization, the Bureau became strongly impressed with a definite and generally expressed public desire for larger ovens in electric ranges. On this account minimum dimensions were established in the specifications on the basis of clear cooking space so as to provide not less than 11″ of height as measured from the lowest position of the oven rack to the bottom surface of the upper element unit, or to top of the oven liner in cases where no upper unit is provided. Similarly, a minimum depth of 17″ with the door closed and a clear width of 14½″ relative to rack guides, were considered necessary. It has been judged from experience and practice that such minimum dimensions are required in order to provide for the preparation of full oven meals including exceptional occasional items such as a turkey.

Other elements in the specifications related to structural design involve accessibility of switches for servicing from the front of the range, and adequate dimensions of recess at the back of cabinet type ranges to provide suitable clearance for customarily employed connection receptacles together with connection plug and flexible cable. These features are particularly important, because of the bearing which they have upon problems of consumer satisfaction and good will, as well as upon the element of installation and servicing costs.

With range designs providing switches located in the back splasher, the problem of conducting necessary servicing operations subsequent to installation had assumed proportions which were considered unnecessarily excessive where switches were not accessible without removal of the range from its position against the black wall. Notwithstanding admittedly improved operating life of range switches generally within the past year or so, certain instances have and will occur requiring ready access to switches and related parts.

Practical difficulties involved in moving a range weighing nearly 400 lb. away from the wall for such service operations, naturally entails considerable expenditure of time as well as

labor, most of which may be eliminated when a design is provided for rendering switches accessible from the front of the range. Moreover, the process of moving or sliding a range over linoleum flooring in which the housewife takes considerable pride cannot help but produce a feeling of annoyance and exasperation. Moving for servicing operations becomes a practical impossibility, or at least is attended by critically aggravated difficulties where ranges are built in as a permanent adjunct of the working surfaces of the kitchen. Consequently, it has been in the interest of the range user as well as of the Bureau itself from a cost standpoint, that the specifications have required that surface unit switches in all cases may be readily accessible for replacement or servicing without the necessity of disturbing the position of the range.

It may be of interest to note that in accordance with the Bureau's requirement for switch accessibility, two different new designs have been developed and produced by range manufacturers. Both of these design principles are particularly ingenious and practicable, and already have been determined by the Bureau of Power & Light to constitute complete and adequate solution to the problem upon which this particular specification has been based.

The requirement of adequate connection recess in cabinet style ranges arose from considerations of a practical nature related to the process of locating the range and equipment during installation. It will be noted that in general ranges are installed and connected by means of a flexible cable and plug with a standard outlet receptacle. Inasmuch as the market for new ranges is largely in existing homes, it will be apparent that in a large percentage of installations, the connection receptacle will not be mounted flush but will be placed upon the surface of the wall. Experience has indicated that in a certain number of cases, structural considerations may actually require that the receptacle be located upon a block some distance forward from the wall and may even have to be placed upon the floor surface.

In order to provide for such conditions and to insure at the same time that the range can be located flush against the wall instead of some distance away from it, the established specifications require that a recess be provided at the rear of the range with a clear depth of not less than 6½" and a clear height of not less than 8" as measured from the floor. As a means of allowing some desirable latitude for location of the range it has likewise been required that the recess described herein shall extend for 10" on each side of the center line of the range. This latitude has been found to be necessary in view of the fact that in arranging conduit and wiring, the practical location of the outlet receptacle is naturally somewhat restricted. Moreover, subsequent addition of other equipment in the kitchen such as a refrigerator, often requires some lateral movement in relocating the range.

Related in part to the structure of the range, the matter of standby oven heat loss has also been considered in the specifications. Accordingly, it has been established as a requirement that ovens shall be adequately insulated so as to keep heat losses within reasonable limits. To this end the specifications require that this standby loss shall not amount to more than 0.5 kw.-hr. per hour with the oven operating at a temperature of 400° F. in an ambient room temperature of 75° F. For the purpose of conducting such tests, as well as others of a similar nature, requiring controlled room temperatures, the Bureau has constructed and equipped a special laboratory test room in which temperature may be kept within 1° F. of any desired point between 60° F. and 110° F.

What a Range Should Have

1. A large oven—11"x17"x14½".
2. Switches for servicing from front.
3. Clearance at back for range outlet.
4. Oven heat loss less than 0.5 kw.-hr.
5. Thermostat-control accurate to 10 deg., plus or minus.
6. It must be able to cook.

A Bureau salesman points out electric range standards

Electrical Equipment Standards

Within the field of electrical equipment, the most important single item related to operating performance of the range is, of course, the oven thermostat. Upon this device depends to a considerable extent the satisfactory performance of the oven in cooking and baking. The utmost in consumer satisfaction together with the corollary desirable reduction of service costs to a minimum, is governed to a large extent by the nicety with which the thermostat performs the job of close and accurate heat control which is its primary and essential function.

One of the most featured points of advantage claimed for electric heating including the application to cookery, has been the accuracy with which temperatures may be maintained. However, at the time the range specifications were being prepared, it was the opinion of the Bureau that additional attention to the heat control problem in domestic ranges was not only desirable but highly necessary. Therefore, in order

to insure accuracy of factory calibration adjustment within reasonable tolerances, as well as the ability of the control to keep temperature variations within suitable and practicable limits, there were written into the specifications two requirements related to accuracy and operation of oven thermostats.

As a condition for approval by the Bureau, it is required that thermostats as supplied by the factory be so adjusted as to maintain average temperatures within tolerance limits of plus or minus 10° F. from dial settings or other acceptable calibration levels. It has also been required that in operation, temperature variations with the oven, relative to on and off operations of the control, or the commonly designated "amplitude characteristic" shall be kept within limits such as practically to call for amplitudes of the order of 35° F. or even 25° F. for all settings of the thermostat within the customary range of cooking temperatures.

In the establishment of the foregoing thermostat characteristic specifications, the Bureau has been particularly solicitous of the needs and desires of electric range users. Increased consumer satisfaction has, and will unquestionably further advance the general public acceptance of electric cooking which is one of the principal aims of the management's policy in providing wiring, servicing, and maintenance of major equipment. The number of service calls arising from dissatisfaction with range performance is already becoming manifest, although the specifications technically have been in effect for less than a year. It is naturally to be expected that much additional advantage will be evidenced in the future through further reduction of servicing and maintenance costs.

The superiority of the enclosed type surface heating units over the older style open coil units has been recognized for sometime from the standpoint of operating life, cleanliness, and ease of maintenance. Consequently, only units of the enclosed type are acceptable in accordance with the Bureau's range specifications. Here again the Bureau has been governed by consideration of the best interests of its consumers, as well as its own, and the range manufacturing industry in general has been in hearty accord.

Cooking Test Procedures

Since the real and final criterion of the excellence of the range is its ability to perform a uniformly satisfactory job of cooking, the Bureau has prepared a series of standard tests for cooking performance. These tests complement the procedures and requirements established through the Standards Committee on Major Electric Appliances, whose efforts are more closely related to technical features such as convenience, reliability, integrity of manufacture of the range as a whole, and the precision of control devices in repeat operations.

As in the case of technical standards already discussed herein the establishment of a series of cooking procedures was dictated by the need for uniform standards relative to utensils and ingredients used, as well as conditions of preparation, so that ranges of different makes and models might be judged upon a strictly comparative basis as to performance. Copies of these standard cooking tests and procedures were issued in April, 1939 to range manufacturers, as well as to other interested agencies within the industry.

In conclusion, it is important to note that in no essential feature did the range specifications, either from a structural or an electrical standpoint, involve any strictly new or exceptional requirement. In a practical sense, each individual specification was already met by some one or more manufacturers producing ranges on a national basis. Naturally, no single manufacturer's product necessarily complied with all of the requirements and the primary purpose of the specifications was to eliminate undesirable features. As has been already indicated it has been the intent of the Bureau management that each element within the specifications be practical and founded upon a well-defined and expressed need.

Acceptance of the specifications as a whole could not but have been expected to involve a certain amount of opposition. However, the manufacturing industry in general has appreciated both the spirit and purpose behind the program and has cooperated to the fullest extent. It is a source of considerable gratification to the Bureau that so much already has been accomplished. It is certain that as time goes on further benefits will accrue, not only to the consumers and to the Bureau, but to the entire appliance manufacturing industry in general, together with its allied dealers and distributors.

"DOWN WITH THE DICTATOR," went the copy of the Washington Water Power Co. in an advertisement telling customers they can have "All the Hot Water they Want Electrically." An old-fashioned hot water heater is pictured complete with a familiar mustach, and a familiar hair combing, symbols of a man who rules with "an iron hand."

Kitchen Promotion

Bureau creates exposition idea to sell more electric ranges

During September and October, the Modern Kitchen Bureau is getting behind electrical appliance dealers and utilities with some expertly planned promotion. An exposition idea is being created for electric range promotion, according to H. L. Martin, bureau manager. With a theme "Change to clean, safe electric cooking now that it is fast and cheap," the campaign is based on the results of a careful survey made on why women do or do not buy electric ranges.

This advertising is divided into a three-phase promotion, with the first devoted to display, sales banners to open the dealer or utility show, store arrows to guide prospects right to floor samples. The second phase considers the salesman. Selling guides will be provided for use in sales training, with methods and models for building store displays included.

The third division will be aimed outside the store. Radio spot announcements, newspapers, and a hard-hitting direct mail program. "See the National Electric Range Exposition right here at home," will be a dealer's buy word for this fall sales season.

And on top of this program, the Modern Kitchen Bureau is instituting a national advertising campaign for electric water heaters that's bound to stimulate sales. *Better Homes and Gardens* will be used in the initial campaign with half-column insertions.

Window banners, booklets and folders, newspaper advertisements and a two-piece direct mail program will tell the story of "Time to Change." A retail salesmen's contest, a new window display contest and utility contest will serve to arouse added interest in this well-rounded campaign.

UNIQUE NEWSPAPER PROMOTION of the month was the Electrical Section run in the Portland *News-Telegram* entitled "Labor to Leisure." Outlining in pictorial form the story of 50 years of home making, the section showed how Mr. and Mrs. Greene lived 50 years ago, and how newlywed Mr. and Mrs. Hume began life. The top of the spreads were devoted to illustrations of Mrs. Greene at her labors, while below, the modern Mrs. Hume supervised her electrical appliances and equipment. In between these contrasting pictures, were the effective advertisements of Portland stores.

Traffic-Getter

Phoenix store keeps appliances moving and makes sales

One of the outstanding "traffic-getters" in the windows of the Vinson-Carter Electric Co., Phoenix, has been a huge turntable, wired so that it is well-lighted, and upon which various appliances can be effectively displayed. Light, motion and beauty in this super-display have paid results.

Salesmen when showing a prospect various features of an appliance, can start or stop the turntable at any desired position to point out a detail they may be explaining. A complete line of appliances may be put on this moving platform.

Carter, being an engineer, is now thinking of putting a control button outside of the store so that people attracted to the window may actually cause the turntable to revolve. A student of trade and technical journals, Carter is always ready for new ideas and promotion.

He is responsible for appliance merchandising operations, which last year sold more than 600 major appliances. His operations are based on the premise that the company must guarantee every product sold, and that it must be of service to his customers.

Salesmen are carefully hired and trained in this twenty-year old concern. They are among the highest paid salesmen in the city, and there is little turnover. Operating a specialty selling organization, the organization defies convention by doing very little house to house canvassing. Salesmen, however, inspect appliances that they have installed, with the thought of being of service. Through this method they are able to get new leads from satisfied customers.

Constant users of advertising space, and radio time, Vinson-Carter also believe in using and sticking to one line. In business as wiring contractors in 1918, they assumed the Westinghouse franchise at that time, adding refrigerators in 1930. By taking on a national manufacturer's reputation and adding it to their own local reputation, the company feels they have an unbeatable combination.

H. D. SPARROW, Schoss-Read Electric Co., Ogden, last year won the grand sweepstakes prize given by the Maytag Northwest Co., covering eight states. At that time he sold 53 Maytags in seven weeks. This year, covering the same territory, he won second prize.

Presto, and Westinghouse appliances turn in the display window of the Vinson-Carter Electric Co. The industrious proprietor, Mr. Carter continually designs and plans new merchandising schemes

Sales Shorts

Fresh ideas and new activities continue in busy fall season

Seattle is selling more electric ranges and water heating systems than any other city in America, according to Eugene R. Hoffman, Seattle City Light superintendent. "This has been the best summer in the history of City Light," he stated. "Largely responsible for the business increase," he said, "is the Adequate Wiring Campaign being conducted and newspaper advertising. Department stores and electrical dealers generally have found their sales stimulated by City Light's advertising campaigns for electrification. One large department store reported it had sold more ranges in the past four months than during the past three years."

KELVINATOR DIVISION of the Nash-Kelvinator Corp. is sponsoring a "Hit the Line" Contest among its wholesale men. Beginning Sept. 11, and lasting until Dec. 2, this nationwide promotion will have as a grand first prize, five new Nash Lafayette Six two-door sedans, one for each of five sales divisions. The sale of each Kelvinator household electrical appliance will count a definite number of "yards gained" in this "football conference."

DANIELS JEWELRY CO., Phoenix, though they are jewelers at heart, have a leaning toward electrical appliances. Recently they took on several lines, and now offer home cleaning systems, waterless cookware, and even electric shavers. A full page ad in the Arizona *Republic* was used to tie-in with Daniels' promotion in these many and diverse lines of goods.

WATT'S UP is the burning question answered and asked by the Idaho Power Co. in a new fall sales campaign. "It's Time to Light Condition," says the utility, and goes on to show how this is done. Running from Sept. 5 to Oct. 31, the company hopes to sell 6,500,000 watts of "good lighting." Prizes, tie-ins and other stimulating promotional ideas will be used to fill the sockets. store away spares, create greater wattages and increase lighting levels.

"TWINS FOR THE JONES FAMILY," is the title of a big Idaho Power Co. campaign that hopes to sell 800 electric ranges and 400 water heaters to 35,000 "Jones Families" throughout southern Idaho and eastern Oregon. Starting Sept. 5 and ending Dec. 24, this campaign is designed to move along in four Big-4-week sections, with commissions and prizes as extra features for salesmen.

COMPLETELY in character of the ABC book is "The ABC of Home Comfort," elaborate 4-color offset consumer booklet prepared by the Cleveland Heater Co., Cleveland, Ohio, to aid dealers in the sale of Rex Automatic Water Heaters.

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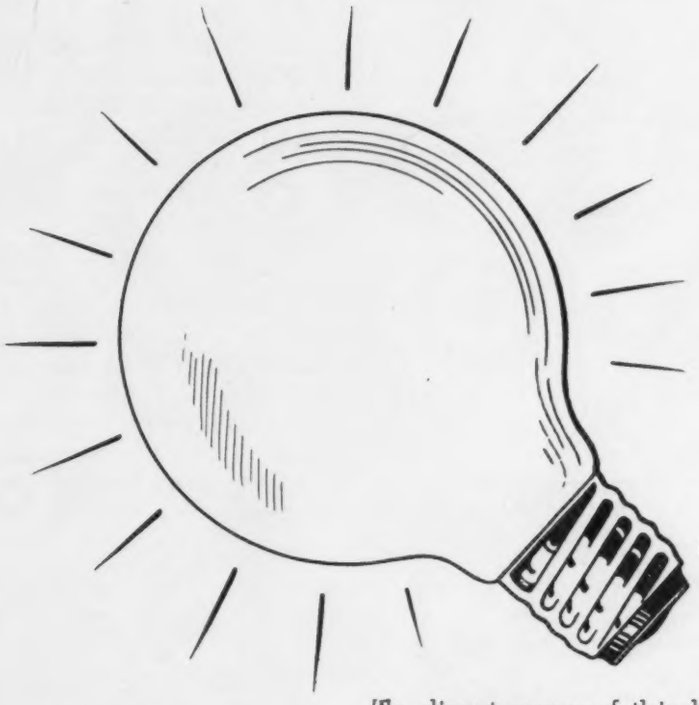
No. 10-c OCTOBER, 1939

Electrical West

Sales Guide

Sugar—

To the grocer sugar is a staple. It sells in quantity but the margin is small. Where the grocer comes out is on other lines, carrying a better mark-up, sold along with the sugar. Yet sugar brings people in to buy.



So it is with lamp bulbs though more profitable. They are the sugar of an electrical stock. Lots of people come in to buy them. But—

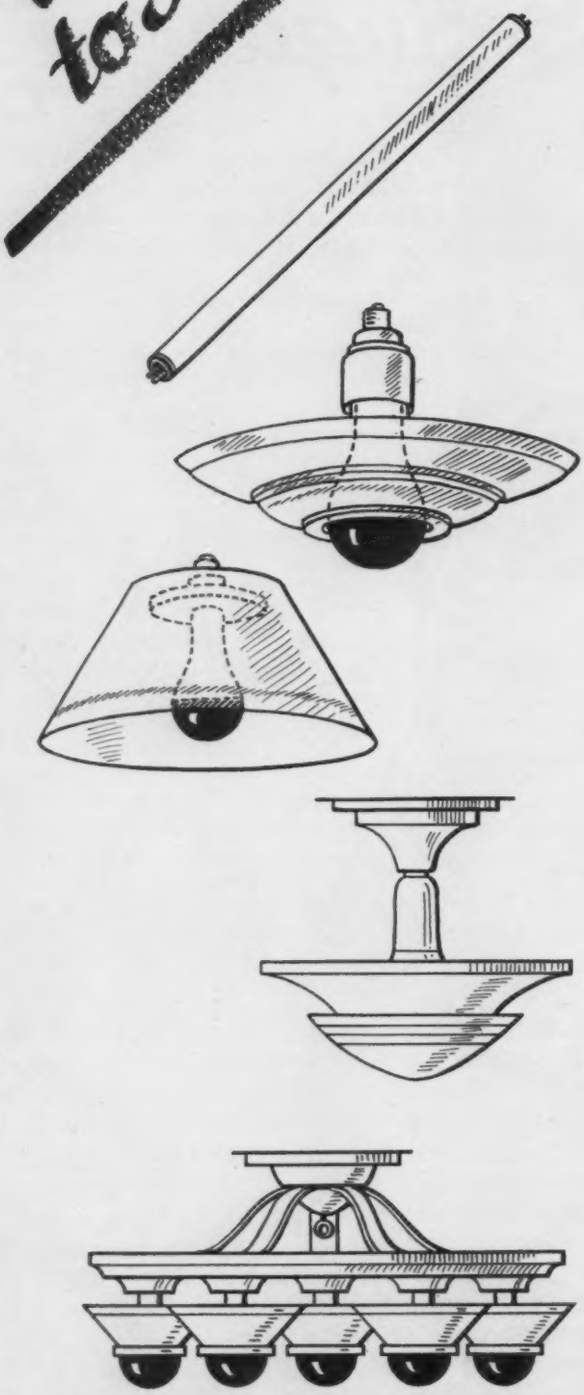
to sweeten up profit—

any wise dealer or salesman will sell up into the special lamps and lighting accessories where the profit is. Such profit lamps include silver bowl, three-light, projector flood or spot lamps and flourescent and lumiline lamps. The profit accessories and adaptors include kitchen enclosing globe adaptors, plastic adaptors, silvered bowl lamp adaptors, ceiling fixture plastic, parchment or metal shades, bridge lamp modernizers, old floor and table lamp modernizing bowls, and hang-on-the-wall or pin-to-the-wall brackets. Most jobbers and whoesalers now carry a line of this adaptor equipment. It is attractive, easily demonstrated, easy to install without wiring or mechanics, and the market has hardly been touched.

To direct some of this business to you there will be the most extensive advertising and radio campaign this fall and winter since the invention of the incandescent lamp 60 years ago. Not only will the lamp manufacturers make the 60th anniversary of the lamp a special event, but the manufacturers of I.E.S. floor and table lamps are conducting a nationwide campaign too. **Light Conditioning** will be suggested everywhere. Utilities too will be telling the story in your own town papers. Be ready to cash in on this "sugar".

What Mazda Lamps mean to you

What to Say



Talk "Light

It gives you that split-second

Difference between profit and loss is sometimes a matter of a split second. Take lamp bulbs, for example. A customer can come in and ask for a 25-watt lamp. If she buys just that one lamp you've made a sale, but no profit.

Lamp sales can be profitable instead of just an "accommodation" by making the most of a split-second. Your lamp counter is placed in a prominent place. That is just good sense. Lamps are such staples that just to see a display of them reminds most folks of the need for a new one to replace the bulb that burnt out last night.

The secret of making money from lamps is this: If you place a representative lot of lamp adaptors, and special lamps, (such as illustrated on these pages), near the bulbs, you make it easy to pick one up. As you get the lamp asked for, pick up an adaptor, or a silver bowl lamp. Then in your split second say—

"Have you seen these? They are the very newest idea in **light conditioning** your present lighting fixtures. You know how glaring it is to look into bright bare lamp bulbs. See, this shade converts the bulb into a "better-sight" lamp, easier on your eyes, more comfortable."

That may be all the chance you have. She may not be immediately interested. She may not buy right then, but you have given her an idea. **"Something can be done about my old fixtures then. We can have better light and better sight this easily."**

With a few well selected words said in a natural easy way in that split second chance that the purchase of a lamp bulb gives you,

STAMP OF APPROVAL

Recommended by Your

THE MONTANA POWER CO. • UTAH POWER & LIGHT CO.
IDAHO POWER CO. • CALIFORNIA OREGON POWER CO.

Conditioning"

opening to a better sale

you have made way for the sale of silver bowl lamps, shade adaptors, special lamps and even wall lamps and IES lamps.

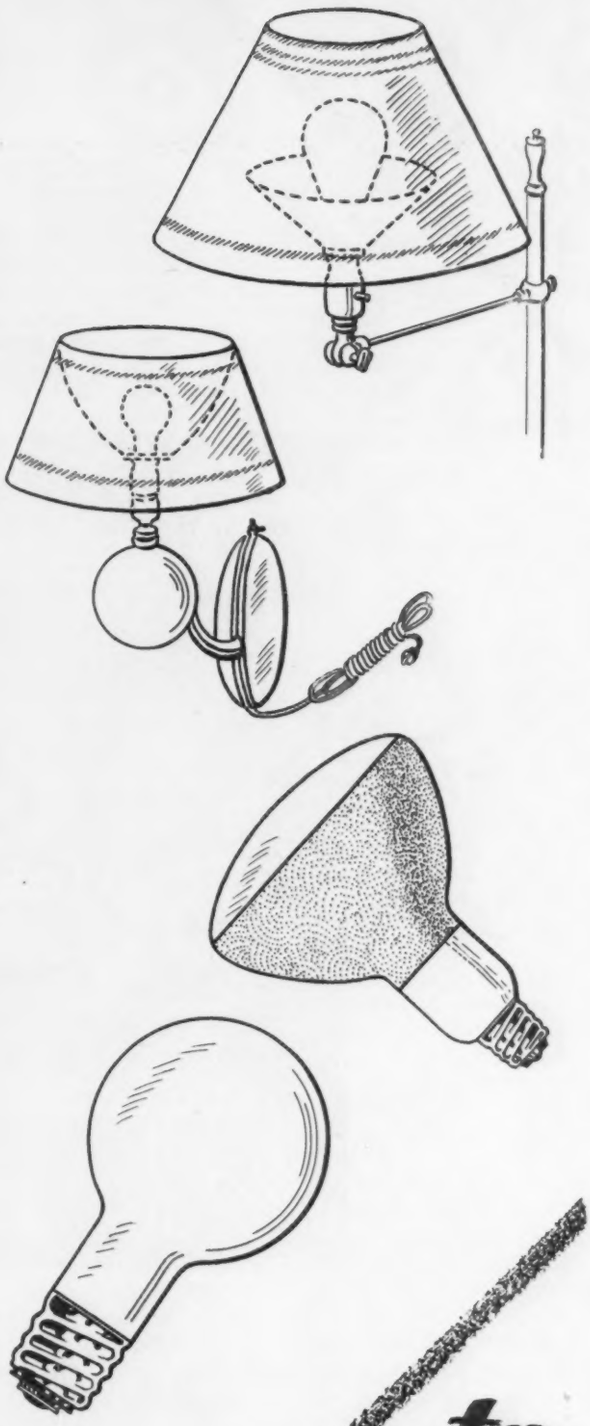
This opening gives you a chance often of suggesting a larger lamp size, because it does not cost any more. The shade makes it possible to use higher wattages and still have comfort. Tell her that. The silver bowl lamp with an adaptor shade is a little indirect lighting fixture in itself.

"Nice thing about these," you can say to her, "is that it doesn't take any wiring or bother to use them. Just slip the bulb into the shade like this, and screw it into the socket. You'll get a kick out of being able to convert your old fixtures into modern and good looking ones so easily. Give you real eye comfort too."

You are talking her language, her home, her eyesight. She will react—if not then—later when she has time to think about it a little. Then she will come back to hear more. Those glaring bare lamps have been bothering her a long time. You've planted the idea that she can do something about them, easily, inexpensively perhaps.

When you get this chance to tell her, either right then if she is interested, or when she returns, show her how the shades diffuse the direct light, and reflect the usable light. Tell her she can now have plenty of light without discomfort. The bigger lamps cost no more. The rates never were so low. Lamps give 27 times as much light for the money as they did 15 years ago.

These special lamps and accessories will make your lamp business really profitable.



to

give them
the habit of coming
to you - Sell

Mazda Lamps

Sales Allies —

PUGET SOUND POWER & LIGHT CO.
PORTLAND GENERAL ELECTRIC CO.
WASHINGTON WATER POWER CO.

What to do—

Feature "Light Conditioning"

Raise your lamp sales into profit production by offering your customers "light conditioning" aids to convert their old style lighting fixtures and lamps into more healthful, comfortable light producers. Make your lamp counter a center for shades, adaptors, socket fixtures and pin-to-the-wall lamps. Keep these adaptors so handy you can pick them up and demonstrate their use to every lamp purchaser.

Formerly such really good seeing aids were hard to find. Neither you nor the customer who enquired of you for them could find where to buy them. But now your electrical wholesaler should be carrying them. In case he does not, here is where you can get information as to where you may find them. Try the wholesaler first, then write to these:

Leonard R. Foss Studios,
1338 E. 12th Street,
Oakland, Calif.

Artalier Co.,
1814 E. 40th St.,
Cleveland, Ohio

The Duv. Co., Inc.,
Benton Harbor, Mich.

Plastics Division,
General Electric Co.,
Meriden, Conn.

General Electric Supply Corp.,
Offices throughout the
West, home office Bridgeport, Conn.

The Railley Corp.,
6611 Euclid Ave.,
Cleveland, Ohio

F. W. Wakefiield Brass Co.,
Vermillion, Ohio

Vision Aids, Inc.,
Kinney Bldg.,
Newark, N. J.

Lumidor Co., Inc.,
Alhambra, Calif.

La Salle Lighting Products Co.,
143 Seneca St.,
Buffalo, N. Y.

—and How

Background

What's New in the Electric Appliance Picture?

What Changes Have Taken Place To Cause Dealers Concern?

What's to be Done About It?

Such questions as these prompted the Business Development Section guidance committee, of the Pacific Coast Electrical Assn., to investigate the background of present-day appliance sales in the setting up of the program for the forthcoming conclaves in Long Beach Oct. 12, 13, and San Francisco Oct. 19, 20. This background sets off in relief the actual questions that will be discussed at the conclaves themselves. While the conclave program will present in outline these discussion subjects a glimpse at the background and the consequent reasons for presenting these subjects for open discussion by those in the industry is worth more than a glance. It has been developed by H. C. Rice, Southern California Edison Co., merchandise manager; O. R. Doerr, Pacific Gas and Electric Co., general sales manager, and W. E. Cranston, Thermador Electric Mfg. Co.

Traffic Appliances

There is the necessity for renewed public interest in many types of small appliances and, once sold, to keep them in constant use. There is also a considerable change in the number and types of sales outlets available to manufacturers and distributors. Also quite as important is the factor of inadequate wiring which is limiting the use of these appliances. These factors, plus the inability to put to use the available advertising promotional material has created a definite bottleneck in the distribution of small appliances to the public. For these reasons some phases of the problem worth discussion are as follows:

I—A recommendation that all manufacturers of small or traffic appliances place a replica of a duplex convenience outlet printed on substantial card stock, in each appliance package. On the reverse side of such a card it would be explained first that the appliance should be plugged into a similar convenience outlet in the home to obtain the best service; second, in the event that a convenience outlet is not available, one can easily be obtained at small expense by consulting the nearest electrical contractor, or for further information, a call to the serving utility.

II—Study of the classification of dealer outlets for small appliances to determine where an effort should be made to get greater results. This study should include electrical dealers, hardware stores, furniture stores, home furnishing stores, department stores, jewelers, art stores, and specialty shops. The machinery for making such a study is available through the distributors and manufacturers. One angle would be tabulation of the guarantee cards that are returned from appliances sold. Another would be checking the acceptance of the "deals" which are offered from time to time by distributors. The third would be information developed by round table discussions of this subject.

III—Study of the desirability of shortening the number of items in each line, with more attention given to design, useability, style, eye appeal, etc.

IV—How best to plan to help dealers use and follow up the manufacturers' sales and promotional plans.

V—Study of different types of sales outlets to obtain suggestions as to the kind of advertising and promotional materials to be used to best advantage. Obviously materials suitable for jewelry stores would not be acceptable to the hardware or home furnishing stores.

VI—Study of the replacement market on electric irons. In spite of the fact that this market is conceded to be 100% saturated there is less than 40% saturation on automatic irons, indicating a wide-open market of at least 60% for the sale of automatic irons.

VII—Home appliance shows. Each fall the manufacturers have previews of their new appliances for dealers throughout their territories. Yet there is a considerable gap between acquainting the dealers with the new merchandise and presenting it to the public. What is the possibility of having a series of home appliance shows held in vacant stores in smaller cities and towns in which the utilities would be in cooperation with all of the manufacturers and dealers? This plan has been tried successfully and it is recommended that a committee be appointed to study further possibilities of this method of sales promotion.

VIII—How best to tie-in with Modern Kitchen Bureau national campaigns?

Home Laundry Equipment

This industry feels the need of some type of stabilization, especially as regards prices and trade-ins. It also has the problem of obtaining and keeping good salesmen and creating more home demonstrations. For purposes of analyzing this problem, the discussion will be divided into three subdivisions:

(1) Reintroducing home laundry equipment to the public on the plane of service rather than price. The point would be that of discounts and trade-ins and ethical sales methods.

(2) Obtaining and training salesmen. Home laundry sales have been superseded by many other specialty appliances in the selling field to such an extent that it is difficult to interest salesmen. This subject should require careful study and analysis.

(3) Methods of obtaining and capitalizing on demonstrations, both in the store and in the home.

Refrigerators

Difficulties of the domestic electric refrigeration industry are many and varied, but the following subjects need discussion. Solutions or even parts of the solution would be of great help to the industry:

(1) Cost of operation. The industry is being plagued by the high cost of operation of the older units still in service. Steps should be taken to acquaint the public with the efficiency and low operating costs of new units. Ways, means, and methods should be developed by the committee for use of the entire industry. Special emphasis, it is felt, should be placed on local methods in disseminating information of this kind to individual customers and prospects. A check of actual cost of units in homes of customers in each community would be beneficial and the use of this information to refute the claims of high cost of operation could be made. All local advertising might be tied to the theme of "economy."

(2) Future markets. The sales technique of selling and distributing domestic electric refrigerators is changing rapidly. It requires considerable thought and study as to the best method to be used to prevent demoralization within the industry. The market could be broken down into four classifications. A discussion of each classification is worthwhile.

(a) Replacement market. Under this heading comes such questions as (1) trade-in allowances (2) method of approach to present users.

(b) Sales to new homes. As a result of increase in homebuilding a large market has been created. In these new homes only the new type of equipment should have been allowed to be sold instead of permitting customers to move into new homes with old, obsolete, and inefficient equipment.

(c) Sales to ice users. This and the competitive refrigeration situation deserves some thought and study.

(d) Sales to low income custom-

ers. Under this classification could be included, in some instances, the ice users. In other cases it would pertain to those customers who do not have any refrigeration of any type. In some cases this is caused by inability to make the necessary commitment. Under this heading would be the question of long-time financing.

Ranges, Water Heaters, Air Heaters

Despite years of effort and activity within the industry, people engaged in the electrical industry still labor under false opinions as to the cost of electric cooking, the speed of operation, and similar phobias.

(1) Discussion of the need to acquaint the people in the electrical industry with the speed and economy of electric cooking, water heating, and air heating.

(2) Like many other highly competitive situations the elimination of destructive sales methods is very necessary. Plans for some organized method of doing this need discussion.

(3) The rented house problem still remains an unsolved mystery. Perhaps a trial plan would work. This and several other ideas might be developed by discussing the renter problem and what's to be done about it.

(4) Some concern has been felt by managements of utilities, because of a question planted in their minds by competing interests, as to the demand and diversity factors on electric ranges, water heaters and air heaters. A committee was set up to study this problem. Something of its work should be understood by the industry.

These subjects represent only the appliance part of the Business Development Section program at the conclave. Lighting, wiring, power sales will also be discussed in a like manner. At the general assembly on the Friday morning of each conclave three subjects will be handled and presented to the entire business development group. These are presentation of the agricultural power handbook, (2) adequate wiring, (3) appliance merchandising. The air-conditioning committee and the petroleum electrification committee also will meet to discuss similar breakdowns of its problem. More details of the program itself and the personnel of the discussion leaders will be found on page 58.

ONCE AGAIN P. G. and E. is making use of radio, this time with a program of classical and semi-classical music presented for two hours every night from 8 to 10 o'clock over Station KYA, San Francisco. This program has been on the air for about nine months as "The Evening Concert," and has built up a large following among music lovers. It presents recorded selections, carefully selected, offering the Boston Symphony Orchestra, the London Philharmonic Orchestra, the Philadelphia Orchestra, the British Broadcasting Company Symphony Orchestra, and the Paris Conservatory Orchestra with famous conductors and soloists. Commercial and institutional announcements are to be used. Station KYA has excellent reception in the eight immediate San Francisco Bay counties, dialing in at 1230 kilocycles.

Sales Increase

WWP dealers report higher percentages of business

Sale of electrical merchandise has shown a definite increase, according to Lewis A. Lewis, assistant general manager of the Washington Water Power Co. in charge of sales, following a study of merchandising reports gathered from dealers over the territory served by the company.

Compilation of sales made by dealers of the territory show a favorable percentage of increase for the month of July, 1939, over July a year ago especially for nine major items. The largest increase has been in the sale of air conditioning units, with 300 percentage of increase for the month of July, and 260 percentage of increase for the first seven months of this year over the same period of 1938.

"This increase in business speaks favorably for the cooperative promotional efforts that have been carried on by the newly organized electrical association including all dealers," Lewis commented. Six units of the association were perfected this spring.

Statistics show percentages of increase for the first seven months of 1939 compared to the same period of 1938 for: home ventilating systems, 40%; oil burners, 40%; refrigerators, 11%; ranges, 20%; radios, 35%; roasters, 16% and clothes washers, 11%.

J. M. CAMERON, outside salesman, Fuller-Watson Ltd., department store at Haney, B. C., recently indulged in an extremely ambitious progressive merchandising scheme for a small community. Five inch x three col. advertisements in the local newspaper carried his photograph with the copy headed "A New Kind of Service Free," announcing that at no cost or obligation he would help to finance any necessary electrical or household appliances. Further down, under the heading "Every Mother and Wife Deserves," Cameron listed kitchen stoves, washing machines, refrigerators, radios, chesterfield suites, sewing machines, rugs and electric pumps and water systems.

When Farnsworth, adding radio to television and establishing a production organization, sent its vice president, Ernest H. Vogel, to launch distribution through Frank Edwards Co., distributor for northern California, first showing was made to dealers of a mobile television unit, designed by Bart Molinari (center), and built in the San Francisco laboratories by him and Ed Atkinson, Al Crooks and John Stagnaro, members of Philo Farnsworth's staff

Future Campaigns

Well-planned selling drives and special events for the West

Western utilities and electrical bureaus are making the most of the time of the year. Customers are in the mood to buy now, and if they aren't in particular localities, these activities will tend to open pocketbooks throughout the west.

British Columbia Electric Railway Co., Ltd.—Continuation of employees' lamp globe campaign, which commenced September 15th.

Bureau of Power & Light, Los Angeles—Range campaigns for Oct. and Nov. Expositions during Oct. and Nov. with theme—"Building Dealer Store Traffic."

Nevada-California Electric Corp.—Range and water heater campaigns for Oct. and Nov.

Portland General Electric — Range and water heater campaigns for Oct. Tie-in with Modern Kitchen Bureau program.

Pacific Power & Light Co.—Lighting campaign for Oct. and Nov. Continuation of radio shows in Oct.

San Diego County Bureau of Radio and Electrical Appliances — Radio promotion through Oct. Seventh Annual Electrical Show set for Nov. 28-Dec. 3.

San Diego Consolidated Gas & Electric Co.—Vacuum cleaner, range, water heater, lamp bulb, radio campaigns for Oct. and Nov. Special events include electric cooking schools through Oct. and Nov. In radio campaign, dealers repair old radio free. Free measuring spoon sets with electrical cooking promotion.

City of Seattle Light & Power—Range, IES Lighting, Electric Heating campaigns for Oct. and Nov. Electric cooking demonstrations at dealers and City Light Bldg. auditorium during Oct. and Nov. Specialized crew selling Better Lighting and electric heating, electric range wiring special, $15.

Southern Colorado Power Co. — Mazda Lamp Light Conditioning campaigns for Oct. and Nov.

Tacoma Light, Range Division—Two-day cooking school in Oct.

Utah Power & Light Co.—Lamp bulbs, ranges, water heaters, small appliances and lamp campaigns for Oct. and Nov.

Valley Electrical Supply Co. — Electric range, water heater and lighting campaigns for Oct. and Nov. Special kitchen exhibit at Del Ray, Merced, Madera and Fresno.

Joy Ride

Desire for electric range wins trip to Golden Gate

The Twin Falls, Idaho electrical dealers associated with the Electrical Equipment Sales Assn., recently awarded a round-trip railway ticket to the San Francisco Golden Gate International Exposition to Mrs. R. V. Jones, of Twin Falls, as winner of a contest conducted in conjunction with an electrical fair staged in Twin Falls.

Mrs. Jones besides identifying appliances shown at the fair, wrote the best statement as to which electrical appliance she would buy if purchasing a new one within sixty days. Her statement read as follows:

"If I were to buy an electrical appliance within the next thirty days, I would be most interested in a range because my most important work, as a homemaker, is preparing food. I'd like to serve more healthful and tastier meals cooked the easy, clean, safe sure way a new electric range should enable me to do. No other electric servant helps today's housewife so much—for so long—for so little."

APPLIANCE SALES REPORT, 1939

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

REPORTING COMPANIES	Idaho Power Co.[1] Current	Idaho Power Co.[1] 8 Mos.	Northwestern Elec. Co.[2] Current	Northwestern Elec. Co.[2] †Mos.	Montana Power Co.[3] Current	Montana Power Co.[3] 7 Mos.	P. G. & E. Co.[4] Current	P. G. & E. Co.[4] 7 Mos.	San Diego Cons G. & E. Corp.[5] Current	San Diego Cons G. & E. Corp.[5] †Mos.	San Joaquin Power[6] Current	San Joaquin Power[6] 8 Mos.	Southern Calif. Edison Co., Ltd.[7] Current	Southern Calif. Edison Co., Ltd.[7] †Mos.	Utah Power & Lt. Co.[8] Current	Utah Power & Lt. Co.[8] †Mos.	Wash. Water Power Co. Current	Wash. Water Power Co. 7 Mos.
Ranges	280	2,452			137	737	396	2,277			89	908					230	1,328
Water Heaters	158	1,220			23	100	283	1,745			48	474					272	1,027
Air Heaters, aux.							114	2,190			13	137						
Air Heaters, 220							133	661			59	401						
Refrigerators	555	4,071			958	4,641	4,925	29,429			327	4,548					1,111	5,572
Dishwashers	4	16					16	85			5	21					1	3
Washers	416	3,239			565	3,711	3,024	18,396			271	2,437					551	3,198
Ironers	24	253			58	402	531	3,204			34	336					29	196
Vacuum Cleaners	160	1,091			168	1,440	2,447	18,297			49	681					183	1,507
Radios	583	4,712			778	7,254	8,303	60,793			397	4,234					1,393	9,127
Mixers	61	449					241	1,835			26	307					87	767
Cookers, Casseroles	33	250			726	5,880					4	33					643	1,980
Irons	576	3,716									255	2,038					608	4,072
Waffle Irons	92	878									57	598					152	1,029
Toasters	225	1,578									91	899					369	2,406
Table Stoves	552	2,495			479	479					13	199						
Heating Pads	39	511									9	248					34	523
Curling Irons																		
Coffee Makers	192	1,517									86	956					355	2,393
Sewing Machines							372	3,195			1	69					68	527
Clocks	125	981									85	1,014					205	1,391
Fans	706	1,923									91	683					1,551	2,113
Floor Polishers																		
Sun Lamps	8	148															4	78
Reflector Lamps	194	2,316									99	1,356						
Misc. Lamps																		
Shavers																		
Yard Lights											35	351						

SOURCES

[1] Figures compiled by Electric Equipment Sales Association. Include power company sales of all reporting dealers.

[2] Lists appliances sold by dealers in Portland area. Figures compiled by Northwestern Electric Company.

[3] Combined dealer and company sales from report of Montana Power Co.

[4] P. G. & E. reports sales of major appliances only based on accurate reports from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. [4] Due to delays in compiling report current and total figures are always one month behind those figures of companies reported in other columns of this table.

[5] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Miscellaneous figures includes fans, curling irons and sun lamps.

[6] Compiled from dealer reports by Merchandising Division of San Joaquin Power.

[7] Includes reports from dealers on San Joaquin Valley system of company as well as Southern California areas served.

[8] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.

† August figures were not available at time of going to press.

Capacitors Switched By Automatic Unit

By R. V. Sanford

THE purpose of this article is to outline a method used by Tucson Gas, Electric Light & Power Co., whereby shunt capacitors regulate voltage at a point 11.2 mi. from the generating station on a 13.2-kv. feeder.

The Tucson company has for some years been an extensive user of distribution capacitors and approximately 1,500 kva. were installed as early as 1929. These were of the original outdoor rack type, installed on two-pole structures at points where reduction of reactive kva. was indicated. Later the manufacturers developed an outdoor pole-mounted unit, which has become quite popular recently, since its use permits the installation at widely distributed points on a feeder of banks of smaller kva. rating. This method, of course, gives a better distribution of the corrective kva. over the feeder area than the rack type.

This company serves a pumping load of about 1,200 kva. at 80% power factor in an area of which the load center is approximately 11 mi. from the Tucson generating station. At the center of the pumping area is a 1,875-kw. steam plant which was erected by the farm company owning the land especially to serve the pumping load. This plant and the 13-kv. system serving the area were acquired by the Tucson company about 1926 and tied to the company's 13-kv. system. The system devoted to the farms handles 33 wells on which are installed pumps of 40- or 50-hp. capacity. During the pumping season, which extends from early April to late Septemer, the load reaches its 1,200-kw. peak. During this time, pumping is almost continuous, although there are periods of 24 to 48 hr. when considerable reduction in load may occur.

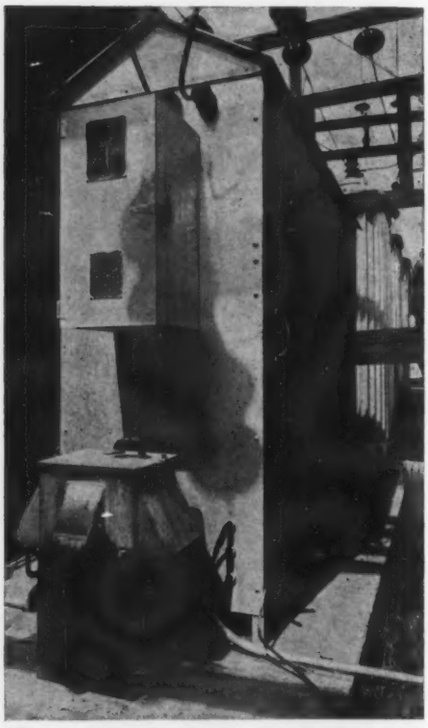
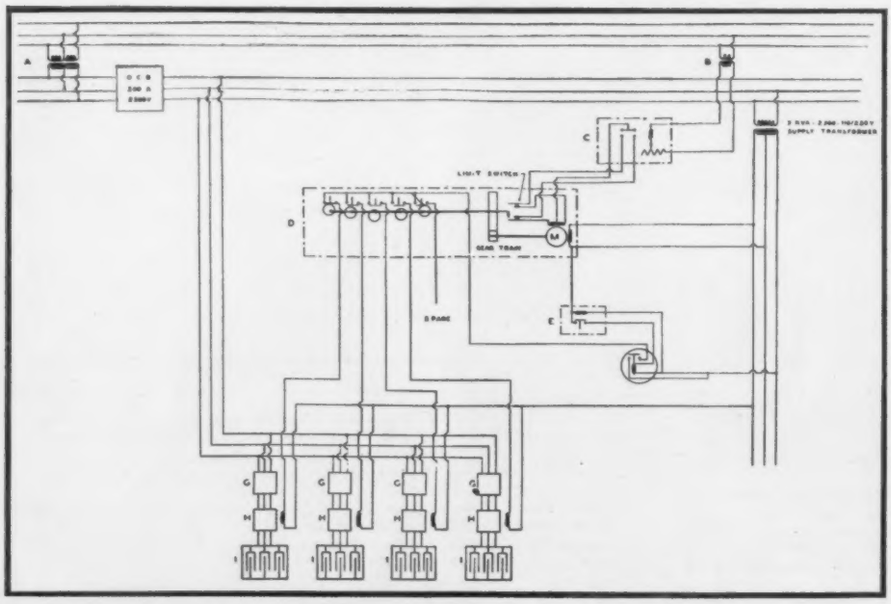


Fig. 2—End view of one rack unit with its associated line switch. Control panel (not shown) carries contact-making voltmeter at top, sequence switch, time-delay relay and auxiliary contactor.

Originally, two 180-kva. capacitor racks were installed in the substation at the steam plant. There were quite successful in reducing line losses and improving voltage conditions in the pumping area. During times of light load, it was necessary to remove them from the line to prevent excessive voltage rise. Switching was handled by the station operator as the steam plant was being held in readiness to run on short notice when needed by the Tucson plant. An operator was available 24 hr. per day.

As pole-type capacitor units became available it was possible to release two more of the rack units. These were placed inside the power plant, and a main oil switch was provided on the plant panel to handle all four units for connection to the plant bus. Each rack unit has its own oil switch. Units were arranged to give a total of 960 kva. or 320 kva. per phase or 240 kva. per unit. A graphic voltmeter was installed, fed from a potential transformer tapped to the 13-kv. bus. This gave the operator a picture of conditions on the transmission line independent of the regulation of the substation transformers.

Fig. 1—Diagram: (A) House bank, three 333-kva., 13/2.3 volt; (B) Potential transformer, 120/1; (C) Contact-making voltmeter; (D) Sequence timing switch; (E) Time-relay; (F) Single-pole magnetic contactor; (G) Oil circuit breaker as supplied with capacitor housing; (H) 3-pole contactor—220-volt closing coil; (I) Four 240-kva., 3-phase, 2,300-volt capacitor banks; (M) Shaded-pole reversible motor



ENGINEERING

Station operators put units on and off the line as transmission voltage indicated. This arrangement operated quite satisfactorily except for conditions occasionally occuring rapidly when operator's attention was taken by some other duty. During summer, this line is occasionally tripped momentarily at the Tucson end by electrical storms. When voltage is restored, load is light for several minutes while time delay relays at each pumping plant are gradually restoring load. During this period, condenser units may cause dangerous voltage rise on the low-voltage bus at the Cortaro steam-plant substation. A high-voltage alarm relay was installed and breakers carefully adjusted to trip at excessive capacitor current.

During this period the company completed addition of a 6,250-kva. turbine to the Tucson plant, and the need of the Cortaro steam plant for reserve capacity became considerably less. It was desirable to reduce the operating crew to one man at this point. Some form of automatic capacitor control was indicated. Accordingly the setup shown in Fig. 1 was designed and built locally.

A contact making voltmeter (C) controls the movement of a shaded-pole reversable motor (m), which in turn drives a shaft on which are mounted adjustable cams attached to the main shaft of the sequence timing switch (D). The cams are so adjusted that mercoid switches are closed in sequence during one revolution of the shaft and opened in the reverse sequence during one counter revolution of the shaft. The mercoid switches operate the holding coils for the capacitor oil switches (H). These are installed between the main capacitor oil switches (G) and the capacitor units. A time-delay relay (E) is connected to hold the 220-volt closing coil supply off the line for 90 sec. following an interruption on the 13-kv. system. The delay enables the control to prevent momentary high voltage following an interruption which may have occurred during full-load conditions.

This device has been in service continuously for 18 months, giving excellent voltage regulation at this point. Since its installation we have lost no individual capacitor units from high voltage, as occastonally happened with manual control.

Adjustment of contact making voltmeter is wide enough to prevent pumping. A variation of 2 volts is necessary to cause sufficient movement of the voltmeter beam to travel from closure of the raising contact to closure of the lowering contact, or reverse. Under no condition of line loading will one condenser bank cause more than 1½ volts variation on the low-tension side of the potential transformer.

Noiseless Light for the Movie Industry

By G. F. Maughmer

WHEN the stars are on the set and dialogue is being heavily breathed or lisped into the microphones, the drop of a pin by an onlooker is enough to send a Hollywood director into retirement. So it is that high intensity illumination without noise plays an important part in the success of film productions in the mad movie capitol.

In this type of lighting, a great deal of current is used. Arc, and incandescent lamps must be non-stroboscopic and as flickerless as possible. Since a single movie set may require a lighting current of 30,000 amp. or more, the motor generators must be large. Studio power sources are principally a. c. and motor-generator sets are used to supply d.c. But large rotating machines emit a certain degree of noise, and are banned from all movie sets.

Machinery noises in studios were formerly avoided by installing motor-generator sets in a substation building remote from the sound stages. But as lighting requirements grew, portable motor-generator substations were built next to the sound stage buildings so that additional current could be delivered to the set without increasing the capacity of the main substation-to-stage d. c. bus. Even these at times created noise.

On location, too, noise has been a problem. Here a substation must be located at a point quite distant from the scene of action. Long cable-runs introduced cost, time and voltage drop difficulties. Silent substations were therefore a practical necessity on location.

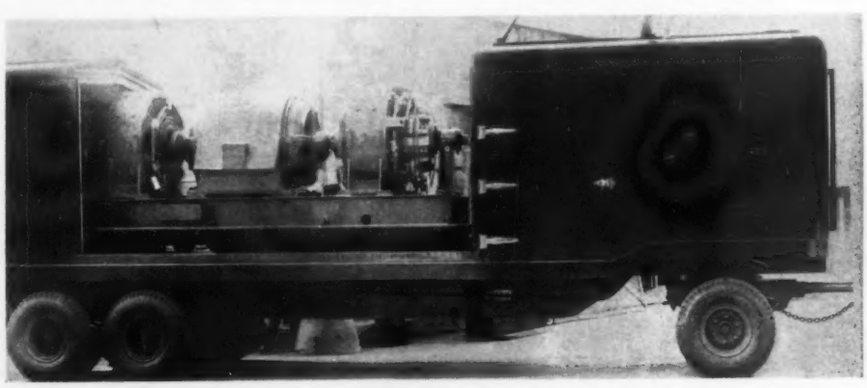
Metro-Goldwyn-Mayer Studios of Loews, Inc. undertook to build portable, sound-proof, a.c.-d.c. substations, having a maximum output of 4,800 amp. at rated voltage. Each is mounted in a 6-wheel standard-gage trailer and covered by an 8-in. sound-proof body. Forced ventilation is accomplished through sound-proofed ducts. The polished steel outside of the body is 28 ft. long x 8 ft. wide, and houses a 300-kw. G-E motor generator set and control equipment. This is built on an extra rigid, welded and cross-braced base which floats away from the trailer frame on rubber.

Each set is driven by a 450-hp. induction motor, designed to operate from 2,300 or 4,600 and 4,000 Y volts at either 50 or 60 cycles. Mounted on the same base with, and directly connected to this motor are two 150-kw., 120/125-volt, compound-wound generators. These have a d.c. ripple of less than 0.5 per cent, and the difference between the rising and falling compound is less than 1.5 volts.

No-load voltage is 120, full-load 125, and the voltage curve between these points is almost a straight line. The machines will carry 200% load for 15 min. and will meet all these specifications at either 50 or 60 cycles without mechanical changes.

These portable substations were designed and built under the supervision of Lou Kolb, chief of the electrical department of the M-G-M studio, who is highly pleased with their performance.

This type of portable "silent" substation is helping Hollywood movie studios to maintain absolute quiet on indoor sets and on location, too. Sound-proof cover over motor generator has been removed



Capacitors Defer $135,000 Investment In Synchronous Unit

By J. F. Roberts

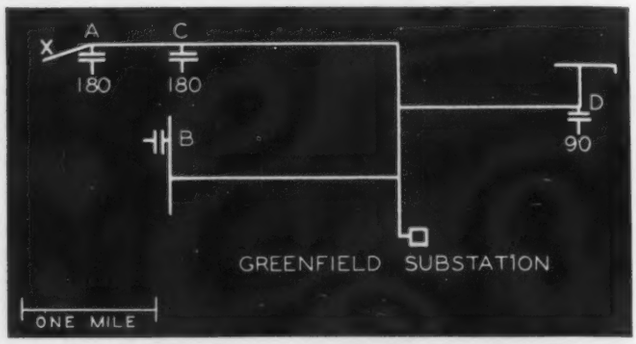


Fig. 1—Salinas Valley area where capacitors were applied

THE recent rate of growth of electric pumping load to the 4-kv. distribution circuits in the Salinas Valley area near the town of Greenfield caused voltage drops and unfavorable power factors destined to become intolerable in a very short time. A hasty survey of the various circuits for study of available methods of correction was made just before the summer of 1938.

This showed that a 10,000-kva. synchronous condenser station (estimated cost $135,000) located at Soledad would be of some assistance. But keeping in mind the fact that powerfactor correction equipment lends its benefits only to that portion of the circuit between point of installation and back toward the generating equipment, it was obvious that pole-type capacitors would not only improve transmission line conditions, reduce load upon the substation apparatus, but also directly improve the operating characteristics of the feeders.

Transmission facilities of the entire Salinas Valley were being augmented at the time of the capacitor installation by the addition of a tower line from Salinas to Soledad insulated for 110 kv., but to be operated temporarily as a 60-k.v. transmission line until such time as transformer equipment and a synchronous condenser should be installed at Soledad. The tower line from Salinas to Soledad was in operation as an additional 60-kv. line serving the area at the beginning of 1939.

Benefits of the capacitor installation, while satisfactory, are thus somewhat obscured by the fact that additional energy is now available in the area under consideration. Because of the capacitor installation, however, the power factor at which this energy is supplied is favorable, and system losses are thereby reduced, feeder and regulator capacities are increased, voltage conditions are favorable, and the investment of approximately $135,000 otherwise necessary far a synchronous condenser has been deferred for several years.

The actual installation of capacitors in the area consists of 3,555 ckva. assigned to circuits out of Spence, Los Coches, Greenfield, and King City substations. Cost of these units installed amounted to approximately $8.30 per kva., or a little less than $30,000 for the entire installation. A typical example is the installation on the North 4-kv. circuit out of Greenfield Substation shown in Fig. 1.

A field survey of the various circuits was made in July 1938, immediately after the capacitor installation was completed. Conditions on the Greenfield North circuit at peak load are typical. The survey showed the following: With all capacitors (630 kva.) connected and 125 amp. on the circuit, regulated voltage at the substation was 125 volts, voltage at point x (see sketch at the end of the feeder) was 116 volts. Power factor was 99.5% leading. Capacitors were disconnected at A, leaving 450 ckva. in service, 129 amp. on the circuit, 126 volts regulated voltage at the substation, and a power factor of 98.5% lagging.

With capacitors at A and B disconnected there were 140 amp. on the circuit, substation regulated voltage was 127 volts, and the power factor was 92% lagging. With capacitors at A, B and C off, the values were 155 amp., 128 volts regulated voltage at the station, and a power factor of 84.5% lagging. With all capacitors removed the values were 157 amp., 128 volts regulated voltage at the station, and a power factor of 82% lagging.

Voltage at point x was 112 volts with all capacitors removed, as compared with 116 volts with all capacitors connected. All current and voltage checks were made within an hour with the motor at point x running, and it is assumed that the load on the circuit was constant during the test. Results of the survey for the entire area show that voltage and powerfactor conditions on the circuits under peak load were greatly improved by the capacitors, and the highest demand of the 1938-1939 pumping season were well served.

Since the load on the circuit on which capacitors were installed is a seasonal irrigation load, little demand occurs during the winter months. Consequently, it has been found advisable to disconnect the capacitors during this off-peak season to eliminate extreme leading power factors. Results of a survey on the North circuit from Greenfield substation taken during light load are of interest in showing the effect of too much capacity connected to a distribution circuit. These appear in Table I.

While there is very little drop in voltage during the off-peak season, it is obvious that the efficiency of the circuit is greatly improved in this instance by connecting the 180-ckva. unit at C in Fig. 1.

Load conditions are being watched during this year as the seasonal load in the area is beginning to increase, in order to determine when and what units should be reconnected for greatest efficiency and adequate service as the load increases. In this light there is considerable study necessary before the greatest value may be derived from the capacitor installation, although the capacitors have fulfilled a most important function in enabling existing feeder circuits to handle peak loads for years to come.

Table I — Effects of Too Much Capacity

Capacitors Connected	Station Volts	Volts at x	Amp.	P.F.
None	121	119	34	59% lag
C (180ckva.)	120	119	23	100%
A & C (360ckva.)	119.5	119	35	61% Lead
A, B & C (540ckva.)	118	118	58	42% "
A, B, C, & D (630ckva.)	118	119.5	70	31% "

Spraying stainless steel to build up seal ring in turbine end-plate

Hydro Maintenance

Detailed experience with troubles which afflict most all the older Western hydro plants. Conclusion of an outstanding report of the production-substation group of the Operating Economics Section, PCEA

By C. P. Rhine

Part II

MAINTENANCE of buckets on impulse turbines has been standardized by most operating companies; however, the application of hard facing to needles and throat-ring seats is still in the experimental stage. However, we feel we have something of interest to offer to those concerned.

Shortly after starting Balch Plant, it was found that the bronze needles and throat rings would not stand the abrasive action of water. These were replaced with a set made of bloom steel. These stood up much better than the bronze.

While in one of the large oilfield shops, ordering the bloom steel billets to make needles, the application of Stoodite, a hard-faced metal, to fish-tail bitts was seen. Later the possibility of applying this to the surface of a small exciter needle was discussed.

After turning the face of the steel needle down ⅛ in. Stoodite was laid over the entire needle (¼-in. thick) by a welder in the oil fields. By the use of a tool post grinder, the needle was ground to the proper size and shape, and when nearly finished, the point of the needle snapped off due to extreme brittleness. It was taken back to the welder, who built up the point again. This time the grinding was completed without mishap—in fact nearly a perfect face was obtained with very few checks or bubbles. This was carefully packed and shipped to the power house. When opened on arrival, it was found that the point had popped off again. This convinced us that this metal was to brittle.

Before abandoning the idea of hard-facing, it was decided to try another metal, a sample of which was obtained from a welding shop. This metal was No. 1 Stellite, an alloy free of iron. Both this and Stoodite had to be laid with an oxyacetylene flame.

In laying hard-face metal on drill bits, the welders were more or less rough, a perfect face not being necessary. However, at least a flawless seat and a perfect orifice is required for hydraulic work. Therefore, it was decided to take more time and try to lay Stellite in our own shop. By use of the oxy-acetylene flame all of the Stoodite metal was melted off the steel base, and ¼ in. of Stellite was then applied. This flowed freer and smoother than the other metal. After grinding, some surface checks and a few small pits were found but there was a good seat.

This needle was put into service on No. 1 exciter in May 1927, and saw service until July 1930. It was returned to our shops, re-laid with Stellite, and re-ground ready for future use.

The companion throat ring of this exciter set was made of bronze, a metal on which Stellite could not be laid. To overcome this difficulty and not lose the use of the bowl, we made a steel ring insert, laid the seat with Stellite, ground to size and shape, set these in the bronze bowls, and brazed them to hold. In reconditioning these later, it was found we could re-lay the Stellite on the steel insert ring without removing it from the bronze bowl.

After this needle and throat ring had been in use about six months on the exciter waterwheel with approximately 2,240 ft. of head it was decided to try and hard-face one of the needles and throat ring on the main unit of the same plant.

With the cooperation of the Haynes Stellite Co., which furnished the metal and a man from their factory to help apply it, Stellite was laid on an old steel needle which had been turned down about ⅛ in. Welding time was 6 hr., and 8 lb. of metal was used.

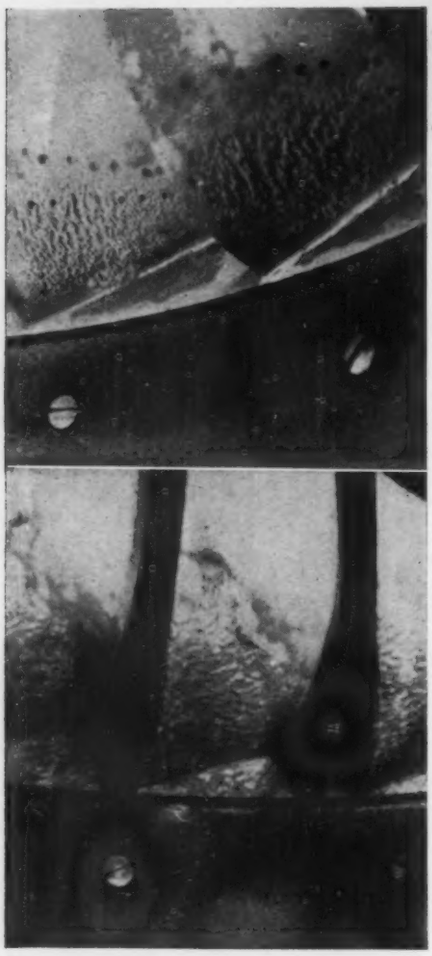
This was set up in the lathe and ground to shape in about 15 hr. A 3,400 r.p.m. tool-post grinder was used.

The first needle had to be re-spotted and re-ground before we got a good seat. There were quite a few small bubbles uncovered in the grinding, and the whole surface was checked. These cracks were caused by the thin layer of Stellite contracting faster than the heavy steel base. Since it had a fair seat, we decided to use it.

The companion 8⅛-in. steel throat ring was turned out ⅛ in., and a band of Stellite about 2 in. wide was laid from the outer edge of the orifice,

which extended about 1½ in. beyond the actual seat. Five pounds of Stellite were used. Welding time was about 6 hr.

After cooling and grinding, we found the same cracks. These ran straight through the seat, which, because of the shape of the steel ring, is at the heaviest section. At the top edge, where the steel ring feathers out, the pull of the Stellite drew the ring in until it was ⅛-in. undersize. This was taken care of by building up with mild steel electrically and machining to size.



(Above) Runner of water wheel before application of Sil-Fos shows effects of cavitation. (Below) Same runner after application—neither ground to mirror finish nor preened

After experiencing this difficulty and experimenting with different heats and welding conditions, which did not help, we decided to make a steel insert with the Stellite seat. The steel ring was bored out, leaving a shoulder to support the insert against the pressure of the water. The insert was made of steel turned to size on the inside for Stellite, and left ½-in. oversize on the outside. After laying with Stellite and grinding to size and shape, the outside was machined to 0.005 in. larger than the bore of the ring, which was expanded by heating to take the insert.

This worked out perfectly. The steel ring was light enough so the Stellite could pull it in as it contracted. Cracks were eliminated.

About this time the Haynes people came out with a No. 6 grade of Stellite, somewhat less brittle than the No. 1 used on previous jobs. This was used on the needles, yielding a surface with very few hairline cracks and bubbles.

During grinding, if a crack or bubble was uncovered, it was spotted with Stainweld (an 18—8 stainless electric rod) without removing it from the lathe. This worked out without a loss of material or time. It is impossible to spot these places with the acetylene torch. To get a good surface it is necessary to re-lay the whole seat.

Original factory set cost about $260, and the first cost of Stellite sets is about $250, but after these have been taken out of service they can be repaired. The Stellite surface of the needle is repuddled, a small amount of Stellite added, and then re-ground to size at approximately $40 labor and $10 material.

The throat-ring insert Stellite seat can be repuddled for a regrind. The outer surface will have to be built up with steel rod, as the shrinkage of Stellite will pull it in. The cost of this will be approximately $45 labor and $10 material, making total cost of a reconditioned set about $110.

Apparatus used for grinding shaft of unit after spraying stainless steel to build up shaft where cut by packing. Shaft is driven at 5 r.p.m. by means of motor-operated gear reduction for control of the butterfly valve

The first main-unit needle and throat ring was in service 25 months, and when taken out was in such good shape that re-grinding was possible. Condition of the Stellite made it possible to increase the size of this ring to 8½-in. diam. without additional Stellite.

In the latter part of 1927 it was suggested that we install a steel insert with steel seat in the bronze bowl of the governor relief valve, which was cutting out. The bronze mushroom valve was to be replaced with one of steel with a Stellite seat. Instead a set made of Nitroloy steel was used—these cut out too.

In 1938 an insert of steel was made and shrunk into one of the old bronze bowls, with good result. This and the Stellite-seated mushroom are in service now.

These can be reconditioned in the same way as main needles and throat rings, at costs proportional to their sizes. In the last ring job, spots were patched by using a rod of 18-8 Stainweld as electrode and No. 6 Stellite as filler rod. This gives an alloy which is much harder than stainless steel, but softer and tougher than No. 6 Stellite, and which lays without checking or bubbling.

Since the original set at Balch power house, all old steel needles and throat rings at A. G. Wishon and Tule River power houses have been replaced with Stellite-coated sets. The service of these is not measured in months, but in *years*.

Breakers and Disconnects

Equipment giving trouble from poor electrical contact area, consists of air circuit breakers, oil circuit breakers,

and outdoor and indoor disconnecting switches. Very often such switches are operated at or near their full-load rating for long periods of time without opening or closing. This allows the contact areas to become coated with a high-resistance film which in turn generates heat at the contact areas. This heating generally increases as time goes on, especially if carrying near rated current. In some cases it has been necessary to install blowers and fans to dissipate the heat from the switches. This method does keep temperatures down to a safe limit. However, it does not eliminate the source of trouble on contact surfaces in the unit.

Contact Heating

Overheating of switchgear contacts is generally due to two causes. The first is misalignment and insufficient pressure exerted on the contact areas. The second is oxidation of the load-carrying contacts. Contacts generally stay in alignment and adjustment except for changes due to the loss of tension in springs. Such changes in spring tension can be caused by high operating temperatures. Copper and brass contactors when newly installed, with contact areas bright and pressures correct make a satisfactory current-carrying device.

The temperature rise in a newly adjusted switch with bright contacts will be at a minimum for a short period of time. However, this depends on the current carried. If load approaches rated capacity, temperature of the switch will begin to rise within a few weeks, because of the contacts, becoming oxidized. Rate of oxidation is in turn increased by the rise in temperature as the switch is maintained in service.

At moderately high temperatures a high-resistance oxide forms rapidly on the copper contact surfaces. Unless this oxide is removed, the increase in resistance further increases heating. Both oil and air switches are usually so constructed that a portion of the oxide is removed by the sliding action of the contact surfaces, which occurs during the operation of the breaker. Often, however, a breaker or switch must carry high currents for many weeks or months without opening or closing, and the increased heating causes serious trouble.

A test on a 2,000-amp. oil circuit breaker, which, since overhaul, had been in service for eleven weeks at nearly 80% rated current, since it was last overhauled, had a contact resistance of 0.0008 ohms. This breaker had a 25-gal. tank. Oil temperature was 92° C. The breaker was overhauled and newly-brightened load-carrying contacts were installed. After adjustment of contacts for correct pressures, a resistance test was made. The value obtained was 0.000021 ohms.

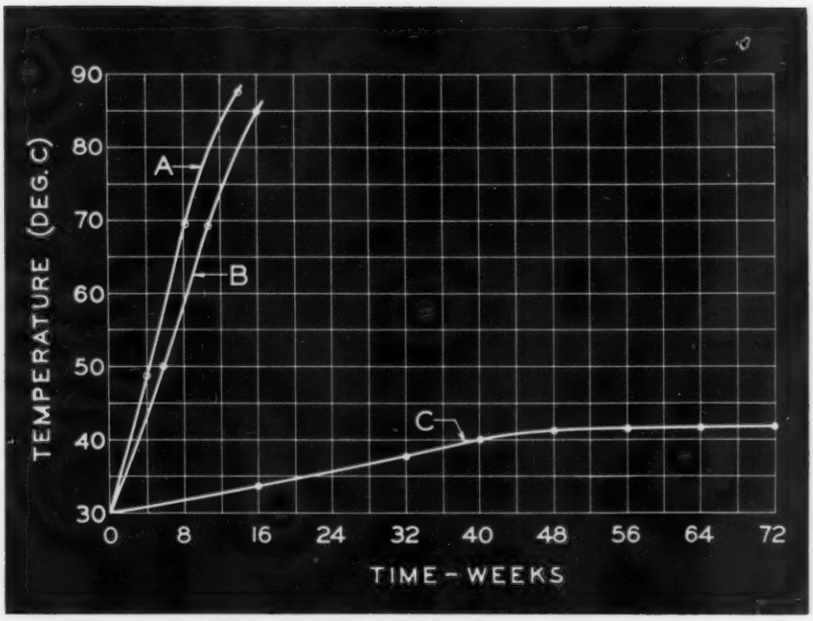


Fig 1—Time-temperature characteristics of copper and silver-plated oil-circuit-breaker contacts. (A) 2,000-amp. breaker before plating; (B) 1,000-amp. breaker before plating; (C) 1,000- and 2,000-amp. breakers after silver plating

The breaker was put back in service and immediately loaded to 80% of its rating, 1,600-amp.

Temperature rise (see Fig. 1) after one month's operation was 19° C., after two months, 40°. Temperature continued to increase slowly, and at the end of three and one-half months, without opening or closing, was 57°.

Condition after this period made it necessary to dismantle and completely overhaul the load carrying parts.

Silver Plating

Silver plating load-carrying surfaces has eliminated to a great extent the trouble due to overheating which has been experienced in the past.

A 1,000-amp. oil breaker, operating at 85° C., was found to have a contact resistance of 0.0016 ohms. This breaker was dismantled and all load-carrying surfaces were silver plated and adjusted for correct pressures.

Contact resistance after assembly and before placing in service was 0.000012 ohms at 24° C. After four months operation at 80% rated capacity, temperature rose 3° above room temperature.

The switch was kept in service for 12 months except for two momentary interruptions for opening and closing. Temperature rise at the end of the period was 11° C. Resistance tests were then made on contact areas. The value found was 0.000027 ohms, an increase of 15 microhms for the year.

This breaker has since completed an additional 18 months' operation with no further material rise.

In the past 30 months the breaker has given no cause for overhauling or replacing parts. Only time spent on the unit was 1 hr. in which tanks were lowered for visual inspection and resistance tests.

Portable electroplating equipment has been made for doing this work in the field. The apparatus is so arranged that plating can be completed about 1 hr. after starting to set up equipment.

Methods Used

Two methods of plating are used. One is the immersion-current method wherein the solutions are contained in small hard rubber vessels, 12 in. deep. These hard-rubber vessels are easy to transport and are light in weight. In them are placed switch parts which carry the moving contacts and require a heavier deposit of silver to take care of wear from the sliding action of adjacent surfaces. Thickness of the silver plate on such contactors varies from 0.003 to 0.006 in., depending on severity of the sliding action. Current densities for such plating are from 2 to 5 amp. per sq. ft. of cathode surface.

Second is the brush-current method, used on stationary contact areas where the film of silver need not be heavy. It is also used for plating contacts which cannot be easily dismounted. The silver film plated by this method is approximately 0.001 in. thick and can be increased or decreased depending on the time spent in plating. Current densities for this method average about 0.75 amp. per sq. in. brush-anode area.

The silver plating solution consists of sodium cyanide, sodium carbonate, silver chloride and water, the anodes being suspended in the hard-rubber vessels. Voltage used for the immersion plating averages about 2 volts, which can be supplied from a 180 or 200-amp.-hr. battery. Several solutions are used for copper and brass contactors preparatory to plating, and in this operation greatest care must be taken to have parts chemically pure before placing in the plating bath. The solutions used are nitric acid, sulphuric acid, muriatic acid, and a cleaning solvent of Proslov for liberation of grease and oil. In handling solutions in this work, rubber gloves must be used, and goggles worn when mixing.

Electroplating current-carrying contacts has gone far in reducing maintenance costs. Tests of many contacts, surfaced with this material, show that troublesome oxidation does not occur. Silver plating assures a free flow of power through the breakers and eliminates outages and maintenance costs from heating. The increased cost of silver-plating circuit breaker parts averages about 30% of the cost of a normal overhaul job and can be expected to bring several years of trouble-free operation.

$35 Services

REA introduces new transformer and low-cost, underground entrance cable for low-use farm connections

IN an endeavor to reduce the cost of making a rural service connection to the point where a minimum bill of about $1 per month will provide enough revenue for amortizing, the Rural Electrification Administration has worked with manufacturers in the development of some new, low-cost equipments. They include a small transformer, circuit-breaker and rubber-covered cable carrying a ground wire outside.

Pointing out that the equipments are for low-use custometrs, REA states that "in practical service they will permit the simultaneous use of a standard electric iron, a radio, and 2 or 3 light bulbs." The breakers are designed to trip at 750 watts—25% overload.

In making installation of one of these new rural services, REA proposes to have the farmer himself dig the trench from the transformer pole to his house to accommodate the low-cost cable, and to fill in the trench once the cable has been laid.

Entire cost of such service, including the transformer, the circuit breaker and the cable, is expected to be about $35.

Production of this type of equipment started with REA's submitting to manufacturers general specifications for the transformer. Each manufacturer, working with REA, then proceeded with his own design and submitted bids on whatever quantity he could furnish.

During the next 18 months, REA expects to buy in the neighborhood of 50,000 units, a 10,000-unit order already having been placed. Atcually, sales are made directly to cooperatives with REA acting as the broker in order to get the benefits of quantity buying. Orders go to the company making the lowest offer to REA up to its capacity to furnish.

Most novel feature of the transformer is its small size. The various designs are sheet-metal inclosed, oil-filled, with the exception of one which is compound-filled. The cable is No. 8 copper, covered with 7/64 in. of special compound rubber. Otuside is a tinner-copper ground wire.

Cost of the cable is stated by REA to be so low that should a farmer later increase his usage, thus requiring more capacity in his service, it will prove cheaper to leave the old service buried than to attempt salvage.

Manufacturers who participated in the transformer design are: G-E, Westinghouse, Allis-Chalmers, Standard Electric, and Kuhlman Electric.

Those participating on the cable are: Okanite, General Cable, Anaconda, Hazzard, American Steel & Wire and Habershaw.

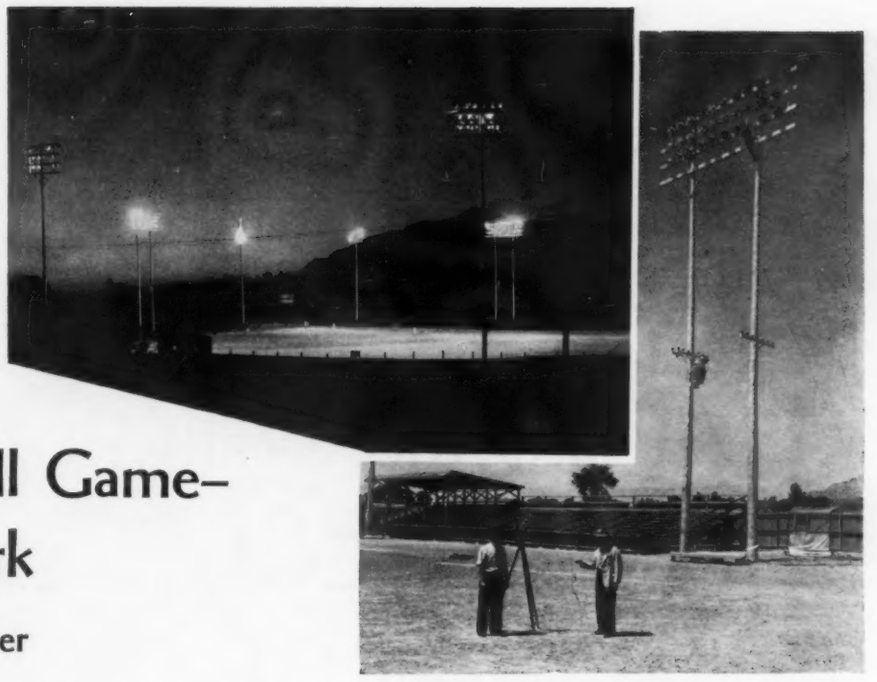
Breakers, which are both single-line and double-line simple magnetic type, were designed by G-E, Westinghouse and Heineman.

Other equipments, in the design of which similar procedures have been followed, include the easy-reading "cyclometer" watt-hour meter, introduced earlier this year, and a new type of lightning arrester.

Working with individual manufacturers, REA expects to develop low-cost equipment for testing circuit grounding and another for testing consumers' meters.

The transformer, cicuit-beaker and cable components of the new low-cost service are now in production, after more than two years of research and negotiation.

(Left to right) The circuit breakers, watt-hour meter and low-cost transformer. The meter is shown merely for purpose of comparison in sizes



Accuracy is the keyword in the floodlighting job installed at this ballpark in Ogden, Utah. Over half of the units used are of the narrow-beam type which compelled engineers to be more definite as to where the beam axis fell upon the field. A transit instrument proved to be of great importance in the focusing of the lights. The secret of correct lighting for outdoors was thus obtained

On With the Ball Game–After Dark

By C. J. Vacher

FOCUSING floodlights on a baseball field has been a difficult job to most lighting men because of the inaccuracies in the methods used. Most installations have required much re-focusing and shifting of floodlights after they have been set the first time. Some of the methods in use are:

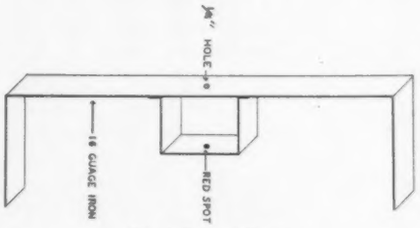
(1) Set the brackets before the units are mounted. This method usually requires much re-focusing after the units are set becouse it is impossible to compensate for the rake the tower will take under the load.

(2) Working from the tower, using a sight on top of visor, then sight the point on the field where the axis of the beam is to strike. Points may be marked by boxes or stakes. This method is difficult because of the locating and sighting-in of the correct beam axis.

(3) A man working on the tower positions the units as directed by a second man on the field. The man on the field is provided with binoculars or field glasses. Standing at the point on the field where the center of the beam is to be directed, and with the aid of the binoculars, the unit is adjusted until this lamp filament is in the center of the reflector. This third method is inaccurate because it is quite impossible to find the exact vertical beam position.

Inaccuracies of these methods prompted us to figure out a way on our Ogden, Utah, baseball field of doing the job more accurately and with less adjusting after the floodlights had once been set. The fact that over half of the floodlighting units used on this job were of the narrow-beam type compelled us to be more definite as to where the beam axis of each unit fell upon the field.

The accuracy of a transit has long been known and it occurred to the writer, while surveying for the location of the towers that this instrument might also prove valuable in the focusing of the floodlights. By sighting through the transit to a floodlight it was easy to perceive its adaptability for this task. Horizontal adjustment of the floodlight was easy, but finding the vertical setting



Steel Strap Clamp

was a problem. It was impossible to align the lamp filament to the center of the reflector. This problem was easily solved by Lloyd Oram, surveyor for the Utah Power & Light Co., who devised a steel strap clamp (see figure) which fits over the face and center of the floodlight reflector.

This strap is about one inch wide and in the exact center is a small drilled hole ¼ inch in diameter. A piece of steel of the same width and extending directly back of the hole three inches was welded to the strap. A red paint mark about ⅛ of an inch in diameter was made on the rear strap piece, which mark lines directly behind the hole drilled in the front strap. By looking only through the exact center of the ¼ inch hole on the face of the strap could the red spot be seen. The small hole and the red spot being in direct center of the floodlight, gave us the exact center of the lamp filament and reflector

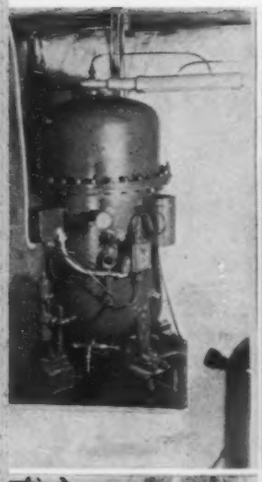
To compensate for the height of the transit we set it a few feet in front of the spot on the field where we wanted the beam axis to fall. Then by sighting up to the floodlight to be focused, and equipped with this improvised clamp and aligning the cross hairs of the transit with the red spot behind the drilled hole, an almost perfect focusing was obtained.

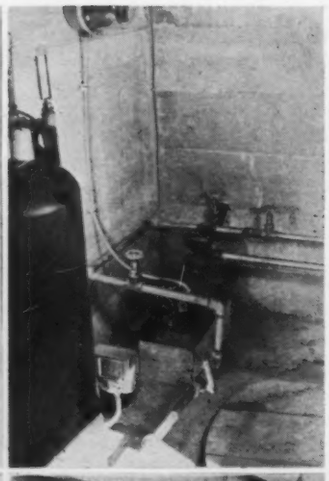
Two men, a lineman and a man with the transit were able to focus the complete installation of 160 floodlights in a trifle over two days. Not one floodlight was re-focused after this first setting. In addition to accomplishing an even spread of light over the field, glare to both players and spectators was reduced to a minimum. The 160 floodlights, equipped with 1500 watt lamps, operating at 10% over-voltage produced an intensity on the infield of an average of 70-foot candles and approximately 30-foot candles on the outfield. Eighty-six of the Westinghouse AV20 narrow beam, polished floodlights and 74 General Electric Type L-48, wide beam, etched units, were used in the installation.

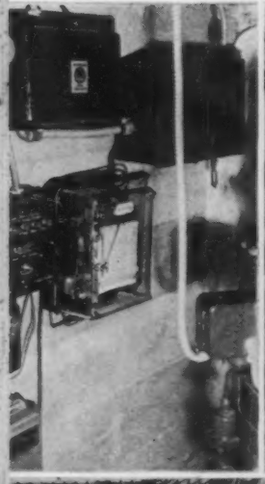
With this method of focusing floodlights, the secret of obtaining perfect lighting jobs on baseball fields lies in the ability to locate on the field blueprint the correct location of each beam axis.

Compactness of architecture contributes a lot to the efficient use of heat in the home of C. E. Boggs, of Idaho Power Co., Boise. Two of the bedrooms are stacked one over the other, with the living, dining and kitchen rooms surrounding them. One bedroom is a half story above the main floor, the other a half story below it, both overlooking a sunken garden court at the rear. Insulation is aluminum foil paper back of lath with three in. of rock wool

Warming the Walls by Reverse Cycle







SEVERAL ideas and new ones, are incorporated in the new home of C. E. Boggs, designer, of Idaho Power Co., Boise. But probably most interesting is that reverse cycle refrigeration and heating used here, is entirely possible and highly satisfactory in even a climate like that of southern Idaho, where winter temperature often ranges from a daily mean of 20 to 30 deg. F. and even dips down to zero on occasion.

Second new idea is that of wall surface heating and cooling. Copper tubing, 6,000 ft. of it, was laid on the lath before plastering. Heat from condensing Freon is transmitted directly into the plaster of the walls. No other heating system was installed, except a fireplace which has not been used yet.

"It soon appeared that there was sufficient heat storage in the heated walls to keep the rooms at a comfortable temperature throughout extended periods of no heat input," said Mr. Boggs. "Time switch was installed therefore to keep the plant off the line during the power company's peak loads at noon and night."

A third interesting feature of this novel home is its compact room and wall arrangement which, with insulation of walls, contributes much to the efficiency of the heating-cooling system.

The house contains 6 rooms, in a space 34 x 55 ft. Total kw.-hr. consumption for the heating season ending in March was 7793 kw.-hr. The Westinghouse type CLD direct-connected, hermetically sealed unit with a 3¾ hp. single phase motor operated with average values of 140 lb. gage head pressure and 40 lb. suction pressure. Cost of pumping well water for the heat pump for the season was 390 kw.-hr. which is comparable to operating an oil burner motor and hence should be disregarded, Boggs feels, in comparing costs of fuel with kw.-hr.

Input to the compressor motor, in calculating plant efficiency from tests on three different days, was 4.8 kw., or 16,400 Btu. per hr. Heat extracted from well water, 9 gal. per min., times 8.5 deg. temperature change, is 38,300 Btu. per hr. Thus total output of heat pump was 54,700 Btu. per hr., a coefficient of performance of 3.33 Water temperature ranges from 61 deg. in September to 55 deg. F. in the later part of winter.

No operating troubles of any kind occurred during the winter, and the house was kept comfortable at all hours with no attention required by the plant. The effect of the warm walls on the feeling of comfort was very marked.

Experience gained in this installation indicates that the cost of electric heat pump need not exceed the combined cost of heating by fuel burning equipment and cooling by mechanical refrigeration under most climatic conditions and that the operating cost of the heat pump with a rate of one cent per kw.-hr. is approximately competitive with fuel oil at eight cents per gal.

It is planned to continued this plant in operation this year but with an air circulating fan and condenser coil added so that a combination of panel and warm air heating can be sample. It was also planned to reverse the compressor connections and cool the house during the summer. Figures on cost of summer refrigeration have not yet been compiled.

Another interesting detail of the home is a built-in lighting panel in the center of the living room ceiling. It contains 480 watts of lamps, louvered to prevent glare.

Construction details, left to right: Westinghouse 3¾-hp. single phase hermetically sealed compressor; 1/3-hp. pump supplying well water to heat pump. Chiller for withdrawing heat from water at left; test equipment, including graphic wattmeter, control panel, timer for periodic cycling of unit, time switch to keep heat pump off power company peaks; making up 15 tubes into a cluster for sweating into return headers; panel or wall heating and cooling tubes, 195 ⅛-in. I.D. copper tubes, total length 6,000 ft., from gas headers in ceiling to liquid headers in basement. Mounted on face of lath and embedded in plaster

Three-Ammeter Method

Possibilities of its use are often overlooked

Although the "Three Ammeter Method" of measuring single phase power and power factor is one of the oldest known, the possibilities for its use, when no wattmeter is available, have been quite generally overlooked. For the benefit of those who are not familiar with this method a brief description is here given.

In the connection diagam, Fig. 1, it will be noted that the three ammeter readings required are (1) an auxiliary resistance load, R, known to be unity power factor, (2) the inductive load, L, whose power factor is to be determined and (3) the total or combined load of R and L. Actually, three ammeters are not necessary for the three readings can just as well be taken consecutively with the same ammeter, provided the line voltage is the same for each reading. For this reason the voltmeter shown in the diagram is convenient although its readings do not enter into the power factor determination.

Fig. 2 shows a vector diagram of the three ammeter readings which, when drawn to scale, can be used for a graphical determination of power factor. The resistance load current, OA, is first laid off on the horizontal voltage vector OE with which it is in phase. The point C is determined by the intersection of two arcs drawn by using the points O and A as centers and the two load currents OC and AC as radii, respectively. Finally, a perpendicular is drawn to the voltage vector OE to determine AB which represents to scale the energy component of the inductive load current OC. Applying formula (1) gives the ratio of AB to AC, which is the power factor of the inductive load.

The power factor can also be calculated directly, without a diagram, by formula (2). This formula is derived from the well known rule in geometry for finding the angles of a triangle when the three sides are given. Formula (3) is given for convenience in calculating the power in actual watts consumed by the inductive load and is used when the line voltage, E, has been metered. Formula (4) is used for the same calculation when the resistance of R is known. When formula (4) is used, the line voltage, E, can be determined from formula (5) without the use of a voltmeter.

The "Three Ammeter Method" of power factor measurement is particularly convenient when making field tests for inductive loads on lighting circuits, such as gas tube lighting. A purely incandescent lighting circuit can be used for the auxiliary resistance load or an ordinary radiant heater element

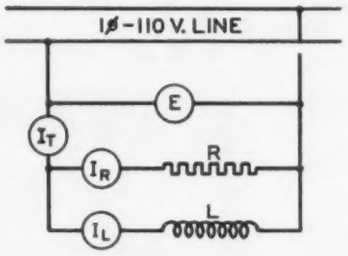


FIG. 1 - CONNECTION DIAGRAM

R = RESISTANCE LOAD - UNITY P.F.
L = INDUCTIVE LOAD - UNKNOWN P.F.

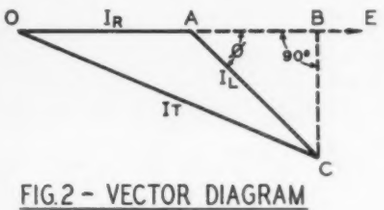


FIG. 2 - VECTOR DIAGRAM

(1) $\cos \phi = \frac{AB}{AC}$ = P.F.

(2) $\cos \phi = \frac{I_T^2 - I_R^2 - I_L^2}{2 I_R I_L}$

(3) $P_L = E I_L \cos \phi$

(4) $P_L = \frac{R}{2}(I_T^2 - I_R^2 - I_L^2)$

(5) $E = R I_R$

can be used for the same purpose. The resistance of the heater element can be accurately determined for use with formula (4) and will not change appreciably with temperature. Ammeter connections can easily be made at the feeder and circuit fuses. Greater accuracy is attained when the resistance load current is as nearly equal to the inductive load current as possible. Voltage variations due to line drop can be avoided by taking each of the three ammeter readings with both loads connected. With reasonable care and accurate instruments, very reliable results can be obtained by the "Three Ammeter Method."

DETAILED ARRANGEMENTS have been completed to have five "Puget Sound" homes all equipped with approved adequate wiring. The houses, each designed by an outstanding architect, are now under construction at Sheridan Beach on Lake Washington. Officers of the Electric Club of Washington and the committee members of the Adequate Wiring Committee feel that the project will aid the entire local electrical industry.

Spokane Model Homes

Adequate Wiring Bureau promotes better wiring in new houses

The advantages and comforts of adequate wiring and low-cost housing within reach of prospective homeowners are demonstrated in three model homes which have been on display in Spokane under the sponsorship of the Spokane Better Housing Committee and the Spokane Adequate Wiring Bureau through the Chamber of Commerce. The houses are the first in Spokane to receive the recently adopted Adequate Wiring Certificates. The three houses have the same floor plan with a variation in the exteriors, and the interior of one home was opened for public inspection.

The wiring, designed to provide for heavy use of electricity, is the outstanding feature in the new homes. Every electrical convenience has been included in the homes. Tubular fluorescent lighting has been used in the living room over the windows and in the bathroom. Such places as garages and entries were well lighted for safety. In some parts of the house, outlets are provided every 18 in. through the use of plug mould, with a total of 68 outlets including weatherproof outside convenience receptacles. The kitchen has five convenience outlets plus special outlets for range, fan, clock, electric dishwasher, disposal unit, ceiling and soffit light. The all-electric kitchens were built from design made by the Spokane Kitchen Planning Service.

Each of the homes has a 40-gal. water heater, with interconnecting thermostats under the kitchen in the basement. A no-fuse distribution center eliminates the danger and trouble of blown fuses. Wiring was under the direction of the Adequate Wiring Bureau. The cost of the wiring and fixtures represented about 5% of the cost of the houses, in the $3500 class, built under FHA terms. About 2000 visitors inspected the house's interior during the week of August 13-19.

LIGHTING SYSTEMS for tennis courts on Seattle's playfields have been authorized by the Park Board which has approved a proposed $15,000 improvement program suggested by the State WPA office. Metered lights are to be installed immediately on two playgrounds at a cost of $3,500 and other installations are scheduled to follow. Under the plan, players will deposit coins in a meter box to obtain light for night playing.

Wyvernwood

Los Angeles development has many modern electric units

Extensive advantage of the modern services provided by electricity is taken in the new Wyvernwood home development opened in Los Angeles Aug. 25. Wyvernwood is a unique community of rental homes built by the D. Herbert Hostetter Estate to occupy a 75-acre site in the southeastern industrial district.

Each kitchen has a Frigidaire electric refrigerator and a Thermador electric water heater. The renter has the privilege of having a Westinghouse electric range at no extra cost. A Thermador electric wall heater is built into each bathroom. There are numerous convenience outlets and many modern lighting principles have been incorporated into the homes.

Wyvernwood has 143 two-story buildings of pleasing modern architecture set in a beautiful residential park. Each building has from four to twelve individual dwellings. A total of 1,102 apartments, flats and studios are being rented unfurnished from $29.25 to $47.50 per month. Units are from three to six rooms in size. Buildings overlook lawns, with their backs to the street. Numerous play areas have been provided for children, as well as facilities for badminton and other adult recreation.

All utility services are underground. Newberry Electric Co. was the electrical contractor. Architects were David J. Witmer and Loyall F. Watson. Wyvernwood is a privately owned, privately financed development and has no connection with any low cost housing or slum clearance projects under governmental authority.

A typical kitchen in the privately-owned new Wyvernwood home development in Los Angeles

Safety Lighting

Sodium vapor lights along highways are saving lives

Nine unidentified persons in the vicinity of Salt Lake City, are alive today all unaware that they owe their lives to a three-mile stretch of sodium safety lighting on U. S. Route 91 here. Twenty-eight other unsuspecting citizens have been spared bodily harm by these same safety lights. These facts are revealed in accident data compiled by the Salt Lake County sheriff's office under the direction of George M. Haley, county surveyor.

Developed by General Electric scientists, the sodium lights were installed in June, 1937 after 12 fatal night accidents and 57 night injury accidents had occurred on the three-mile stretch in two years. Records as of June 1939, show that fatal night accidents have dropped from twelve to three, and that night injury accidents have declined from 57 to 29. This decrease has resulted despite the fact that the early night traffic on the three miles of lighted highway has increased to over 1500 cars per hour, according to Haley.

Commenting on the three night fatalities which have occurred since the sodium lighting, Haley pointed out that "in all three cases either the driver or pedestrian was under the influence of liquor and in no case would the fatalities be attributed to the lighting system, highway or other factors."

San Francisco Bridge

If all the 25 million passenger cars in the United States were driven over an eight-mile stretch of two-way traffic at the rate of 25,000 cars a day, and if there was only one accident for every million car-miles traveled, people certainly would be convinced that highways are as safe as the home. This condition of unprecedented safety exists on the eight and one quarter miles of the San Francisco-Oakland Bay Bridge.

Since the California State Highway Commission opened this bridge to traffic on November 12, 1936, this enviable record has been established to make one of the world's safest stretches of highway. One of the deciding factors of this record is the sodium lighting that has contributed to holding the night accidents down to 1.26 for every accident in the daytime. Also, the G-E sodium lighting system has proven helpful in driving through fogs that drift upward from the water below. A highway that will be as safe at night and during adverse weather as it is during the daytime—that is the growing condition that sodium lighting has made possible.

WARD HARRISON, director of engineering, General Electric Lamp Dept., Nela Park, spoke before a gathering of Southern California lighting engineers and sales people at the Edison Bldg., Los Angeles, Aug. 31. Latest developments in the lighting field were presented Mr. Harrison, whose experience and leadership in the field of lighting design has made him a national authority. J. M. Ketch, Nela Park executive engineer, was another speaker. About 125 men attended the meeting. The chairman was E. P. Markee, manager South Pacific Division of the G-E Lamp Dist., under whose auspices the meeting was held.

A NEW MONTHLY LIGHTING service is available to utilities covering commercial lighting. Inaugurated by the Birchard Co., Seattle advertising firm, the service comes in the form of a monthly magazine entitled "Selling with Light." It is published cooperatively for a number of western utilities who are using this medium to further stimulate interest in modern lighting.

Ultraviolet for Gobblers Increases Farm Load

BY giving turkeys a healthy, mid-winter bath of ultra-violet light, electricity this year has enabled southern California turkey growers to hatch a higher percentage of fertile eggs during the period of high prices, and thus to offer the prospect of bigger birds by Thanksgiving, and to earn a big return on a small investment in electrical equipment. To Nevada-California Electric Corp. the lighting of turkey farms has meant the addition of sizable off-peak loads.

The effect of ultra-violet light on the sexual activity of birds, particularly chickens, was under study at least 13 years ago, and results have become more definitely established as studies have progressed. In 1936, Kansas Agricultural College related such tests to turkeys and established that: long light wave lengths stimulate sexual activity, can produce an early lay. Furthermore, it was shown that these results are not caused by increased feed, although lighting is no substitute for adequate feed or for good management.

Some 20,000 turkeys went under lights this year in Riverside County, and 15 out of 55 important ranches installed lights. Load at one ranch is nearly 50 kw., but 5 to 15 kw. is a more usual range. In San Diego County, another 10,000 birds were lighted.

A normal installation consists of type CX mazdas in 100- to 250-watt units, placed 6 to 8 ft. above ground near roosts, feeders and water. The milder ultra-violet intensities produced by these lamps forestall over-exposure and permit optimum results at lower kilowatt demand than were high-intensity units employed.

By operating such installations through winter months—when ultra-violet sunlight is at low ebb and when, moreover, birds tend to remain indoors—turkey raisers have been rewarded with a laying season beginning in January, whereas turkeys do not ordinarily start laying until March.

Lights are usually started two or three weeks prior to the time when increased laying is desired. Generally speaking, older turkeys will start laying sooner after lights are turned on than will younger ones.

Whether lights increase the total number of salable hatching eggs per hen is a debatable point. Southern California producers say they don't. It also appears that too much forcing causes decreases in fertility, texture and hatchibility. But in any event, the time of laying is radically changed.

F. C. Sollars, agricultural engineer for Nevada-California Electric, has been responsible for adding much of this load to the corporation's lines. That he has succeeded in bringing these benefits to turkey farmers is no accident. Behind the connections which are being made today are his own investigations of turkey lighting, running back 9 years, and his continuous cooperation with the county agent of the U. S. Dept. of Agriculture, which conducts its extension service in conjunction with the State College of Agriculture.

These healthy, "sun-tanned" turkeys in southern California, oblivious of their fate, are living a regal life, at the same time laying more eggs and helping to create large off-peak loads

TO INSURE MAXIMUM usefulness of its loose-leaf farm electrification sales manual, Utah Power & Light Co. includes uptodate lists of all farm organizations, offices and officers in Utah, as well as lists of dealers in farm machinery and equipment for the communities served. Shown are locations of farm bureau offices and the names of farm advisors, home demonstration agents, agricultural inspectors and vocational agricultural teachers for each county reached by the company's lines. Revised sheets are sent out to all holders of manuals when changes occur.

THE ORCAS ISLAND RURAL electrification project near Bellingham, Wash., at the close of its first year's business reports 213 member-subscribers, with sales of 17,000 kw.-hrs. in July. The project's membership a year ago was 133, with monthly sales of 11,000 kw.-hrs. The line has been increased from 47 to 60 mi., with an average increase in kw.-hr. consumption from 50 kw. a year to 79.6 kw. per member in July. Gross sales increased from $1,016.95 to $1,312.92 per month over the same period. The load peak, it was stated, has increased from 62 kw. to 150 kw., according to J. E. Verrison, power district manager.

AT THE CLOSE of last year, 1,400,000, or 21.9% of America's 6,400,000 farms with occupied dwellings were being served with electrical energy, according to figures presented by Ferd J. Schaaf, Washington state director of public service. He said that the percentage for Pacific Coast states was highest, being 73.8%, with New England, 56% and Middle Atlantic states, 54.9%. Rhode Island, however, led all states, with 98.1%, although California was second, with 90.5%. Washington is more than 60% electrified. He also declared that 13% of the total was obtained in 1938 alone, and that the increase in rural electrification in the last three years amounted to 44%.

ELECTRICAL WEST

The All-Industry Magazine of Progress

Established 1887 and Incorporating the "Electrical Journal," "Journal of Electricity, Power & Gas" and "Journal of Electricity"

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World War II

WHEN half the civilized world lays aside the tools of peaceful living for the terrible weapons of war, there is an inevitable shock and re-adjustment to nations everywhere. How will World War II affect America? More specifically how will it affect the electrical industry? Out of a welter of speculation, assumptions, rumor and opinion certain objective facts stand out. But even these must be patterned to fit assumptions.

Assumption number one is that America will remain neutral. In this case three fundamental changes will shape the future pattern. American industry will be called upon to meet the huge increases in world consumption caused by the waste that accompanies all wars; American workshops must pick up the slack caused by work stoppage in the factories of warring nations; American commerce must be reoriented to fit the changes brought by war on the streams of international trade. Each of these directly affects every branch of the electrical industry.

Increased industrial activity means increased demands on the facilities of the utilities. For the present these are ample to care for a demand half again as great as that imposed by industry today. Additional interconnections may be necessary, but there is no shortage in generating capacity, particularly here in the West where Hoover and Bonneville dams can meet any new peaks. Fortunately this region is blessed with an interconnected power network that gives capacity real mobility.

This quickened industrial pace, however, presents other problems. To a considerable degree American industrial capacity is inefficient and obsolete. There has been little modernization in the last decade. To put our industrial facilities on full schedules both as to capacity and efficiency will mean rehabilitation programs in which the electrical manufacturer and contractor will play leading parts.

Increased production means reemployment, larger payrolls and more purchasing power. This will be reflected in greater sales of refrigerators, laundry equipment, electric ranges and other appliances. It will be reflected in demands for more new houses. Hence here again manufacturers, wholesalers, dealers and contractors may expect to benefit.

Here in the Far West where agricultural purchasing power is such an important factor in the over-all economy, the higher income to the farmers brought about by price increases will be spent for pumps, motors and appliances along with other things. This also means that the industry will profit.

Two dangers are attendant on this situation. One is run-away prices. The other is speculative over-stocking that will bring about repercussions such as occurred in early 1937. Having been burned once, there is little likelihood that the industry will play with this kind of fire again.

By any gage the electrical industry's pace and business will quicken definitely as a result of World War II. The upward trend of recent months stimulated by strictly domestic factors is now boosted by these emergency conditions.

If America Fights

ASSUMING that America becomes embroiled again as was the case in 1917, then an entirely new set of conditions faces the industry. ELECTRICAL WEST believes that the electrical industry, like all other American businesses, is unalterably opposed to this country's becoming involved in this war, irrespective of how individual or collective sympathies dictate. If this nation does forsake its iron-hard will for peace, then certain facts will help to lay out a course for the industry.

Irrespective of statements to the contrary, the

utilities are prepared. One cannot foresee such an increase in demand as would tax existing or now building generating facilities. The imminent danger rests in the attitude to be adopted by the forces of the present administration toward the light and power utilities under war conditions. Some say that immediately the whole industry would be socialized as were the railroads in 1917. Study of the program laid out by the War Department in the case of such an eventuality shows no plan or no need for any such drastic step. However, there is every assurance that there will be rigid controls and regulation.

One of the unfortunate conditions attendant upon the depression will immediately become evident. This will be the lack of technically trained men. There is a wide gap in engineering ranks caused by industry's inability to place technical graduates during the worst years of the depression. As a step toward preparedness, thought might be given to the possibility of finding places for such technical graduates as are unemployed now.

If this country should go to war—and Heaven forbid—then every bit of the resourcefulness of the industry will be called into play to assure preservation of initiative and even perhaps, personal liberties.

Why Small Appliances Lag

ANYONE who follows electrical advertising in the Western newspapers should be shocked by the absolute dearth of copy devoted to small appliances. Ranges, refrigerators, water heaters and laundry equipment get their share of sales stimulation from strong and forceful advertising copy. When small appliances are featured, it is usually in the form of a "leader" for one of the larger department stores. Such advertising benefits no one but the particular store. As a matter of fact it frequently establishes in the mind of the prospective purchaser misleading values and thus tends to destroy rather than create a market.

Such small appliance advertising as does appear is usually placed by either the manufacturer or the distributor. Many manufacturers make provisions for advertising allowances provided a dealer will match the amount set up by an equal sum from his gross margin. Despite this, one of the large appliance manufacturers had several thousand dollars in his Pacific Coast advertising reserve at the beginning of this year which had not been used.

Do not conditions such as these answer to some degree the question "What's wrong with the small appliance business?" How can the public be induced to purchase more toasters, roasters, irons, coffee makers, waffle bakers, fans and other traffic devices? It may be heresy, but one answer seems to be to interest the utilities once again in the sale and promotion of small appliances. Certainly the total volume of business was greater when they were a factor in this business. If someone has a better answer, we would welcome it.

Air Conditioning

APROPOS the heat wave that caught the California coast cities unprepared is a thought on air conditioning left by Dr. John B. Lagen, of University of California Hospital, in a talk to the San Francisco Air Conditioning Society.

The human body, said the doctor, is a self-regulating temperature control system, maintaining body temperature at 97 to 99 deg. It can and should be given a chance to take care of the normal changes of temperature of day and night and of the seasons. The role of air conditioning, he claimed, should be to take the peaks of adjustment off the human system, not attempt to maintain a constant temperature which permits the body no normal swing of physiological adjustment within its own range.

Air conditioning then, should take the extremes off the human system—extreme heat, extreme humidity, extreme cold, extreme dust and dirt. When it does this it contributes richly to human welfare.

Turnabout's Fair Play

"WE are expected," said a wholesaler, "to show our new merchandise so that the dealers and contractors can select and purchase. The bulky articles we cannot take around to the stores so we put in a fine display and invite dealers to come in to see it. We have done our part of the obligation to the best of our ability. Then the dealers should do their part and really come in and see the stuff.

"They expect the jobber to cooperate with them in every respect. In their turn they should cooperate too.

"It is not just sentiment, either. Every dealer who comes in is better off for seeing such a display. He can really look over the merchandise, ask questions about it, make a better selection. When he does not come to see the display he must select from catalog sheets and his hopes. If he does not like a line, it is unpleasant for everyone. He may lose money on a poor selection. Certainly he does not work up the enthusiasm for his new stock that he would by seeing it properly displayed and explained.

"I wish you would write an editorial about that," said this wholesaler. But it seems to us that he has written it himself. Any dealer alive to his own welfare will heed—and see the display next time.

Kee-Lo-Watt Tribe Holds Annual Pow-Wow

CAPABLE showmanship by George E. Lewis, manager of the Rocky Mountain Electrical League, drew a crowd of more than 250 electrical men and women to Estes Park, Colorado, Sept. 7-9, first to celebrate the 60th anniversary of the incandescent lamp, then to participate in the three-day annual meeting of the so-called Kee-Lo-Watt Tribe.

That Lewis had done his job well was something for which those who otherwise would not have been at Estes Park could be grateful. For they participated in a meeting which electrical history may record as the starting point of a new progressiveness in association work.

It was League President W. N. Clark, president of Southern Colorado Power, who was responsible for the move which drew into the program representatives from several municipal systems of the area. And it was the open-mindedness of municipal and private system men alike which developed an unprecedented, straight-from-the-shoulder discussion of common problems.

Second important thing about the meeting was the thoroughness with which public relations were discussed.

Both these were implicit in the talk by E. L. Mosley, city manager of Colorado Springs, which he called "Common Denominators". He emphasized the necessity for simplified rate schedules, presented in simple, non-technical language, and the importance of adequate reporting of operations by the company to its customers. "Cities which have consistently issued good, clear reports," he said, "have found little wrong with their public relations."

A. W. Conover, vice-president and general manager, Central Ohio Light & Power, emphasized that a public relations program cannot be set up like a construction budget. He also said, "When dealing with newly-created governmental agencies, we have tried to acquaint them with our problem, and we have found them exceptionally cooperative." Through nine years of experiment, he said, his system has discovered that the best policies have come from the organization up to the management, rather than from the management down.

At the closing banquet, Conover (recently of Colorado) was presented with the League's annual award for outstanding service to the industry of the Rocky Mountain area.

C. W. Leihy, editor of *Electric Light & Power*, suggested that systems interpret their taxes, rates—all statistics related to public relations—in terms of their meaning to one, individual employee, rather than to the system as a unit.

Participating from outside League territory were L. A. S. Wood, Westinghouse's chief lighting engineer; A. F. Dickerson, General Electric's lighting sales manager; A. E. Schanuel, Adequate Wiring Bureau; W. H. Hanna, Modern Kitchen Bureau.

CONOVER CLAY SANDS CLARK RUMP KEARL

A roving camera caught these electrical men at the Rocky Mountain Electrical League convention last month. From top down left to right are (1) Frank Hershberger, PS of Colorado, H. S. Anderson, G-E, Ross Adams, Hendy & Bolthoff, and H. L. Pinkerton, Albuquerque G. and E.; (2) president-elect H. E. Samson, Southwestern PS, Roswell, N.M., M. C. Heffelman, Deming Ice & Electric, N. M., vice-president elect; (3) Gaylord Buck, PS of Colorado, and E. M. Rowland, PS of Denver; (4) Heffelman and H. W. Young, Delta-Star, Chicago; (5) F. Bischolberger, PS of Colorado, Paul Lewis, Nash-Kelvinator, and C. H. Elliott, PS of Colorado; (6) C. W. Leihy, ELECTRIC LIGHT & POWER, and Bert Rowley, Hotpoint

At the Edison dinner, Herbert S. Sands, Denver consulting engineer, and one-time Edison worker, was introduced by L. R. Storey, Convention Chairman. Sands sketched a picture of the love of work and scorn of fatigue which measured the famous inventor's success. He suggested that the industry's future honors will go to men operating on those principles.

Speaker at the convention banquet was Karl E. Mundt, U. S. Congressman, South Dakota. He spoke on "The America I Want." America at war, he said, will be the end of democracy. If America stays at peace, democracy may be saved. To save it, he said, the people must act to return the balance of economic power to local groups, whether private, municipal or state. He argues that once Uncle Sam becomes established as our biggest banker and our biggest business man, there will be but one check upon him—revolution.

A trout fry, excursions into Rocky Mountain scenery and dancing were among diversions, while Bert Rowley, Hotpoint, won the Billy Sterne golf trophy.

Elected president for next year was H. E. Samson, Southwestern Public Service Co., Roswell, New Mexico; vice-presidents, M. C. Heffelman, Deming Ice & Electric Co. and E. E. Brazier, General Electric Supply Corp., Denver.

Redrafted for active duty, this time as a vice-president, was Gaylord Buck, vice-president and commercial manager of Public Service Co. of Colorado. J. W. Alexander, Rawlins Electric Co., also was re-elected as vice-president. In summing up the public relations discussions, emphasizing the importance of men down the line, Buck delivered the meeting's tersest sentence: "Sergeants won the first World War."

Electrical Day

Industry celebrated at Golden Gate International Exposition

Electrical industry day at the Golden Gate International Exposition, San Francisco, was a social success even though some of its educational features suffered for lack of publicity. Designed to bring those working in the electrical industry in all of its branches and departments together for acquaintanceship and to learn something of the contribution of the industry to the West and to the Fair, the day had excellent attendance of electrical people. Publicity in the daily papers as to the purpose of the day was lost amid the war news.

Consequently the opening feature, a talk honoring Philo Farnsworth, Provo, Utah, and San Francisco inventor of electronic television, had small attendance from the school boys for which it was designed. Nevertheless, Don K. Lippincott, friend and counsel of young Farnsworth, did not disappoint those who came.

The industry rally at 2 p.m. drew many away from the attractions of the Fair to hear its prominent speakers. R. M. Alvord, General Electric Co., San Francisco, substituted for R. E. Fisher as chairman of the day, introduced by Clyde Allen, general chairman. Mayor Angelo Rossi welcomed the electrical folks to the convention. The mayor attributed the success of both the 1915 and the 1939 expositions to the spectacular lighting.

C. J. Strike, president, Idaho Power Co., Boise, Idaho, talking on "What Is the Electrical Industry," enunciated the principle that "Business makes prosperity; prosperity doesn't make business". The industry, he said, was brought about by a cycle of discovery and inventions, manufacturers to produce devices, distribution to wholesalers, contractors and dealers, and utilization of the produced electricity. That the industry with its record of accomplishment was under fire, he said was unfair in view of the realities. If private industry could enjoy the same exemptions in taxes and the same low cost of money as that offered government projects, he predicted a 40% reduction in rates.

J. Scott Milne, vice-president, International Brotherhood of Electrical Workers, speaking on what the electrical industry means to labor, reminded that in America everyone from the president to the laborer with a shovel is a worker. In presenting a human-interest contrast between the days before electricity and the present time, he declared, "our lot in life without the electrical industry would be one that none of us would like to go back to." No one would want to go back to sad irons, to hand-washing, to candle light, to hard, tedious labor in industry without the use of electrical tools.

O. R. Doerr, general sales manager, Pacific Gas and Electric Co., and chairman of the Pacific Coast Electrical Bureau, Northern Division, spoke on "Selling the Electrical Industry". That people accept ideas slowly he illustrated by several examples and pointed out that although the industry has made remarkable technical progress the job of everyone is to see that neighbors and people across the street, and industries and business make more use of these technical devices and the benefits of electricity to improve working conditions and to better life. He urged support of the various promotional organizations within the industry in their endeavor to further the use of electricity.

The biggest success of the day was the grand ball in the evening, at which a number of electrical appliances were given as door prizes. The ball was in charge of W. J. Varley, manager, Electrical Contractors' Assn. of San Francisco, and the prize awards were made by Charles Foehn, business agent, No. 6, IBEW. Committees handling the various details of electrical industry day included members of all branches of the industry in seven western states. M. H. Schnapp, General Electric Co., handled the distribution of industry day badges and attendance. Original idea for the day came from Carl Severin, president of the San Francisco Electrical Contractors.

Agenda

Western electrical leagues continue their constructive activities

Programs of various associations throughout the eleven Western states are swinging into the fall season with renewed vigor. Conferences in San Francisco during August tended to stimulate new ideas and develop new energies.

Central California Chapter, IAEI, Taft, Calif., will hold its next meeting Nov. 3. J. R. Lazarus, 447 Sutter St., San Francisco, is secretary.

East Bay Electric Club, Oakland, Calif., met Sept. 11 at a luncheon to hear Glenn C. Marsh, service engineer, Sperry Gyroscope Co. First meeting of the 1939-40 season was held Sept. 18. Ted Williams, radio technician, was a guest speaker.

NECA, Los Angeles Chapter—Membership meeting held in Rosslyn Hotel; two business meetings each month on 2nd and 4th Mondays.

NEWA, Pacific Division—Meeting of Pacific Division at Victoria, B. C., on Oct. 5-7 at Empress Hotel.

NECA, Santa Barbara Chapter—Business meetings Sept. 14th and Oct. 12th. Dinner meetings, Sept. 28th and Oct. 26th. Sept. 11-16 club took part in display booth of home wiring exhibit at National Home Show held in local armory.

San Diego Electric Club—Met Sept. 12th to hear Dr. Clinton G. Abbott, curator of San Diego Natural History Museum, speak on "Down to Mexico City in your own car." Chairman of the day was Wm. de Waard, San Diego Consolidated Gas & Electric Co.

Southern California Chapter, IAEI, Southwest section—Will meet Nov. 15 at Torrance, Calif., to discuss inspector problems.

Utah Electrical League—19th Annual Outing was held Aug. 16, with J. L. Schricker, general chairman.

Electric Club of Washington—Met at Arctic Club Sept. 11 for 1st meeting of 1939-40 season. C. E. Arney, Jr., director of Washington Radio Forum, discussed "Radio in the Present Crisis."

Contractors

Hear of chain store wiring, labor relations program, laws

INROADS into electrical contracting already made by the chain mail-order houses and department stores was a revelation which came to the joint convention of electrical contractors associations of northern and southern California, at Asilomar, Sept. 22, 23. Predicted by Earl Whitehorne, editor of *Electrical Contracting*, at the Los Angeles convention of NECA, two years ago, the gradual infiltration of these large sales organizations into wiring was reported from all sections of the West.

Reading of a letter from S. G. Hepler, executive committeeman for National Electrical Contractors Assn., in the Northwest, precipitated the discussion. Hepler told of the state contractor's license held in Washington by one big chain for more than a dozen cities and of inquiries he had made into the situation. Immediately California contractors told of similar activities in their localities, most of them indirect, or carried on through a wireman who contracted labor only. The long-term financing of an entire house, including the wiring, was declared by some as the most potent wedge into the wiring business used by these chains.

As a joint meeting of the contractors from both ends of the state, the convention was presided over in turn by Ken Ryals, Stone-Ryals Electric Co., San Francisco, president of the Electrical Contractors Assn. of Northern California; A. L. Stone, Stone Electric Supply Co., Los Angeles, executive committeeman for Division 9, of NECA, and by Clyde L. Chamblin, California Electric Construction Co., San Francisco, vice chairman of the NECA labor relations committee.

Labor relations was the central topic of importance in the two day convention. On Friday evening J. Scott Milne, vice president, International Brotherhood of Electrical Workers, opened the program with his address. His talk, straightforward, and mincing no words, was a surprise because of the emphasis he placed on the necessity for both contractors and wiremen to become more salesminded and to develop more business. He told how organization of power company employees had resulted in a more cooperative attitude toward contractors and wiremen by union members in the sales departments of the utilities and urged that all branches of the industry learn to sell as well as to make or install equipment.

In speaking of contractors he told why wiremen are interested in profitable business methods. "If you do not get a fair profit," he said, "we can't get fair wages." Milne also said that the IBEW was soon to start working for a union label on all materials and equipment handled by its members.

Contractors from all parts of California at Asilomar

The contractors' said of the labor situation was told at the Saturday afternoon session by Paul M. Geary, field representative for the labor relations committee of NECA, who made a special trip West for the meeting. Geary explained the seven point program of NECA as follows: To foster organizations of contractors to deal on equal terms with the IBEW; To develop with labor unions sales promotional activities for more adequate wiring; To cultivate codes of fair practice; To arbitrate industrial disputes, taking over the job formerly done by the Council of Industrial Relations; To assist local associations in their labor negotiations and contracts; To foster and maintain close harmony with IBEW; and to work with the latter for the maintenance of installation standards.

The selling part of the program was geared directly to contractors and their business opportunities too. Graham Holabird, National Electrical Products Corp., Los Angeles, presented the Pacific Coast Electrical Assn. "Question Box" illustrated talk as a preview to the regional meetings to be held in October and November. In it the contractor is stimulated to ask questions that will lead to business chances, not necessarily for large jobs, but in the everyday local home town shops and stores about him.

Walter Carlson, incandescent lamp department, General Electrical Co., San Francisco, presented the newest developments in fluorescent lighting equipment and explained the particular fields for which this new lighting is best adapted. He demonstrated the new 48-in lamp, the twin auxiliary or ballast which now corrects power-factor and eliminates stroboscopic effect, and the glow starter switch.

Government and law were covered also in talks by Roy Butcher, chairman of the state contractors license board, Allen Miller, registrar of contractors; by J. D. O'Connor, chairman of the legislative committee of the northern California association, and W. J. Varley, business representative, San Francisco Electrical Contractors Assn.; and by Walter J. Walsh, San Francisco attorney.

Butcher announced that on Oct. 15 a new program would be inaugurated by the license board. Miller then described it as the first step in prequalification examination of applicants for new contractors licenses. These examinations will be held at the three state offices, Sacramento, San Francisco and Los Angeles regularly and in outlying communities at announced times and places.

Walsh gave a pre-reading of a paper he had prepared for the NECA convention at Philadelphia, Oct. 9-12, and which will be read there by Clyde Chamblin. "Competition and the Law," was its title, and in it Walsh gave legal poof of the lawfulness of making a fair profit, of running a bid depository, and gave assurance that the Bill of Rights still holds, despite encroachment by departments of government on it.

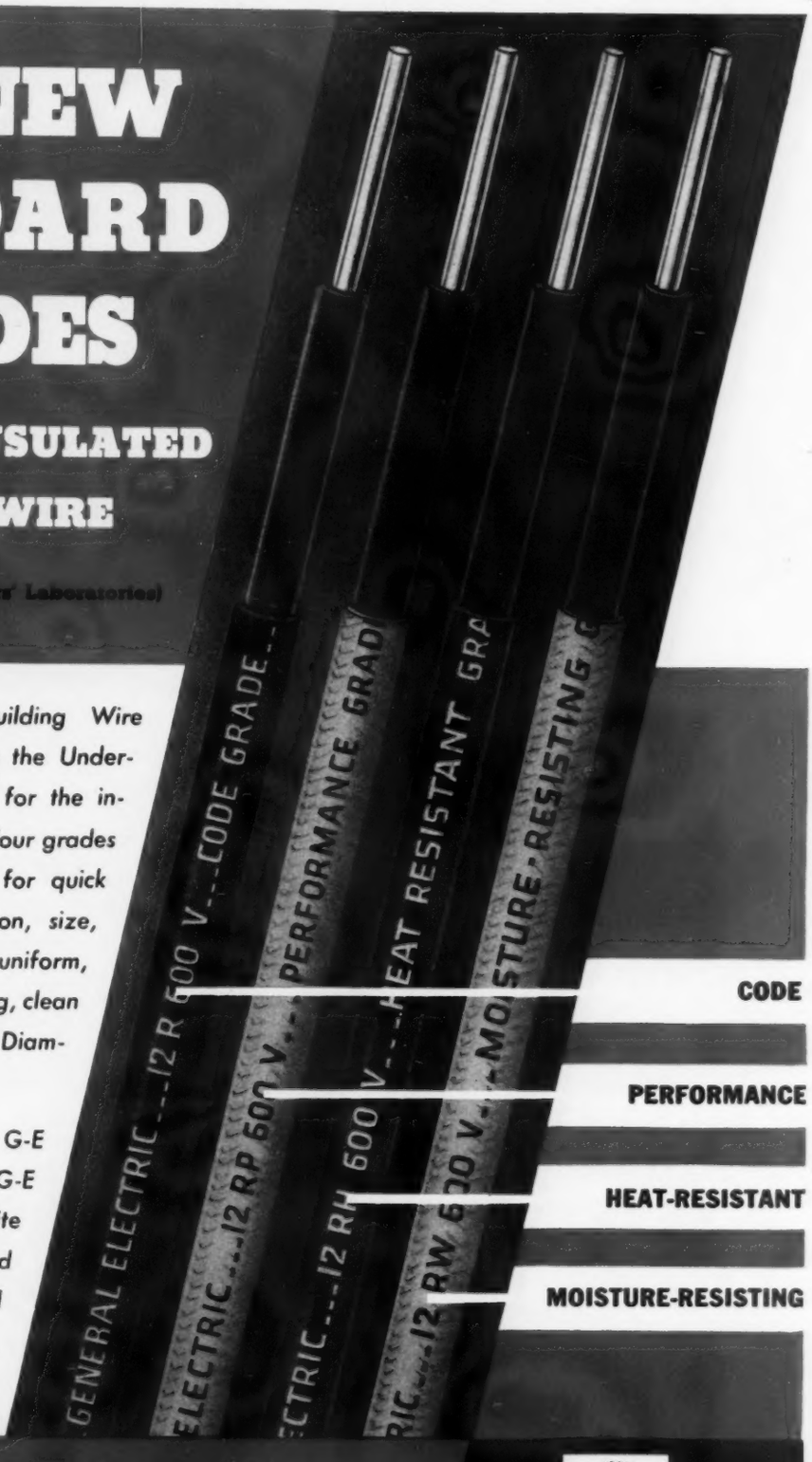
Other topics covered were a warning as to the "Ham and Eggs" measure on the November ballot, compensation group insurance plans, apprenticeship training, group medical insurance, use of data and pricing books, and a review of transactions of importance to contractors at the IES and inspectors' conventions and the Adequate Wiring Conference recently held in San Francisco.

GENERAL ELECTRIC OFFERS

THE NEW STANDARD GRADES

G-E RUBBER-INSULATED BUILDING WIRE

(Approved by Underwriters' Laboratories)



General Electric Building Wire meets and surpasses the Underwriters' requirements for the insulation used on these four grades of wire. It is marked for quick identification of insulation, size, type and voltage. It is uniform, dependable, easy stripping, clean stripping and easy to pull. Diameters are uniformly small.

For further information on G-E Building Wire see the nearest G-E Merchandise Distributor or write to Section W-9710, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.

GENERAL ELECTRIC

SEE THE HOUSE OF MAGIC

PCEA Conclaves

Fall programs set for Long Beach and Oakland

Program arrangements have been completed for the two fall PCEA conclaves to be held at the Civic Auditorium, Long Beach, Thursday and Friday, October 12 and 13 and at the Hotel Oakland, Oakland, on Thursday and Friday, October 19 and 20. General assemblies will open and close both conclaves. Except for the two luncheon meetings at each conclave the programs for the parallel sessions are identical.

At Long Beach the Thursday luncheon will be addressed by W. C. Mullendore, executive vice-president, Southern California Edison Co., while Dr. Everett Dean Martin, economist of Pomona College, will speak at the Friday luncheon.

At Oakland the luncheon speakers will be James Mussatti, general manager, Calif. State Chamber of Commerce on Thursday, and Alfred J. Lundberg, president, Key System, on Friday.

The complete program for each of the three sections follows:

BUSINESS DEVELOPMENT SECTION
F. C. Todt, *Chairman*
E. G. Stahl, *Vice-Chairman*

THURSDAY MORNING, 10-12

LIGHTING GROUP Northern sponsor, L. A. Hobbs; southern sponsor, G. M. Rankin.
- School Lighting, Discussion leaders—north, G. A. Trosper; south, A. I. Benedict.
- Commercial Lighting, Discussion leaders—north, Walter Carlson; south, Alston Rodgers.

WIRING GROUP Northern sponsor, J. O. Dillingham; southern sponsor, C. A. Rowley.
- Contractor Participation, Discussion leaders—north, to be selected; south, Max Fry.
- Builder Participation, Discussion leaders—north, J. S. C. Ross; south, David S. Moir.
- Banks and Loaning Agencies, Discussion leaders—north, to be selected; south, Fred Yerger.

POWER GROUP Northern sponsor, W. P. L'Hommedieu; southern sponsor, P. P. Pine.
- Industrial Power and Heating Data, Discussion leaders—north, G. N. Hawley; south, J. A. Corlett.

SMALL APPLIANCE GROUP Northern sponsor, O. R. Doerr; southern sponsor, H. C. Rice.
- Traffic Appliances, Discussion leaders—north, J. J. Burns; south, Charles L. Moore, A. J. Cole, C. H. Thrane, E. M. Frellson.
  - Convenience Outlet Promotion
  - Classification of Dealer Outlets
  - Shortening Lines
  - Dealer Helps

RANGE, WATER HEATER AND AIR HEATER GROUP sponsor, W. E. Cranston.
- Speed and Economy, Discussion leaders—north, A. C. Miller; south, John Adams.

AIR CONDITIONING COMMITTEE Chairman, H. H. Douglas.

THURSDAY AFTERNOON, 1:30-5

LIGHTING GROUP
- Domestic Lighting, Discussion leaders—north, M. H. Jankelson; south, C. E. Merryweather.
- Highway Lighting Committee, R. E. Fisher, chairman, Technical Sub-Committee, W. P. Bear, chairman.

WIRING GROUP
- Planning Services, Discussion leaders—north, George Zelhart; south, Herbert J. Mann.
- Wholesaler's Participation, Discussion leaders—north, Arthur Dahl; south, Ted Russell.
- Journeyman's Participation, Discussion leaders—north, George Barker; south, E. E. Mecham.
- Standardized Services, Discussion leaders—north, Wm. A. Cyr; south, C. A. Rowley.
- The Red Seal Symbol and NAW, Discussion leaders—north, C. E. Heise; south, P. P. Pine.

POWER GROUP
- Problems of Welding and Therapeutic Equipment, Discussion leaders—north, to be selected; south, C. L. Ashley.
- Competitive Power Problems, Discussion leaders—north, Walter Howell; south, Stuart A. Cundiff.

SMALL APPLIANCE GROUP
- Traffic Appliances (Continued), Discussion leaders—north, J. J. Burns; south R. Sloan, D. C. Pence, Sam Scott, Joe Shull.
  - Advertising Material
  - Replacement Market in Irons
  - Home Appliance Shows
  - Modern Kitchen Bureau Campaign
- Home Laundry Equipment, Discussion leaders—north, Geo. Dickie; south, John Gunderson, Stanley Curtis, P. R. Buehler.
  - Service vs. Price Appeal
  - Salesman Training
  - Demonstrations

RANGE, WATER HEATER AND AIR HEATER GROUP
- Sales Methods, Discussion leaders—north, Clyde Allen; south, W. S. Fleming.
- Trial Plans, Discussion leaders—north, M. Henoch; south, C. H. Kauffman.

AIR CONDITIONING COMMITTEE

FRIDAY MORNING, 9-10:30

JOINT SESSION OF LIGHTING AND WIRING GROUPS
- Modernizing Buildings, Discussion leaders—north, Walter Heston, Ralph Wiley; south, Frank Hansen, Otis Newcomb.

POWER GROUP
- Industrial Power Handbook, Discussion leaders—north, Frank Angle; south, A. I. Laws.

SMALL APPLIANCE GROUP
- Refrigerators, Discussion leaders — north, George Lloyd; south, T. J. McIntyre, Wm. Dudley, C. H. Kauffman, Fred Yerger.
  - Increased Efficiency of Modern Units
  - Future Markets
    - (1) Replacements
    - (2) New Homes
    - (3) Ice Users
    - (4) Low Income Bracket

RANGE, WATER HEATER AND AIR HEATER GROUP
- Report of Demand and Diversity Factor Committee, C. E. Heise, Chairman.

AIR CONDITIONING COMMITTEE

FRIDAY MORNING, 10:30-12

GENERAL ASSEMBLY, BUSINESS DEVELOPMENT SECTION
- Agricultural Electrification Skit
- Women's Plewpoint on Appliance Merchandising—Shirley Douglass, *Sunset Magazine*.
- Joint Meeting with Operating Economics Section, Discussion of Proposed New Wiring Methods—N. B. Hinson.

OPERATING ECONOMICS SECTION
A. G. Jones, *Chairman*
H. A. Lott, *Vice-Chairman*

THURSDAY MORNING, 10-12

PRODUCTION AND SUBSTATION GROUP Presiding—north, E. F. Maryatt; south, T. C. Stavert.
- Waterwheel Maintenance and Modernization, Discussion leaders—north, E. A. Crellin and Ray Quick; south, to be selected.

TRANSMISSION AND SUBSTATION GROUP, Presiding—north, E. M. Wright; south, W. B. Loper.
- Power Factor Correction, Discussion leaders—north, C. G. Smith; south, to be selected.

METERING GROUP Presiding—north, C. F. Gilcrest; south, A. D. Irion.
- Substituting 15 for 5 amp. meters, Discussion leaders—north, Mel Clark; south, to be selected.

THURSDAY AFTERNOON, 2-5

PRODUCTION AND SUBSTATION GROUP
- Manual vs. Automatic Starting of Rotating Equipment, Discussion leaders—north, W. R. Baker; south, to be selected.
- New Developments in High Speed Pick-up of Load in Steam-Generating Plants, Discussion leaders—north, V. F. Estecourt; south, to be selected.

TRANSMISSION AND DISTRIBUTION GROUP
- Unit Substations, Discussion leaders—north, F. R. Beardsley; south, to be selected.
- Lightning Protection, Discussion leaders—north, W. C. Smith; south, to be selected.

METERING GROUP
- Effect of Test Periods on Meter Accuracy, Discussion leaders—north, Geo. Searle; south, to be selected.
- Metering of Low Power Factor and Intermittent and Distorted Wave Shaped Loads, Discussion leaders—north, H. D. Noren; south, to be selected.

FRIDAY MORNING, 9-12

GENERAL ASSEMBLY, OPERATING ECONOMICS SECTION
- Results of Utility Cooperation with the Army in War Games following Recent Tests—Lt. Col. Leland H. Stanford (N.B. This will be at northern conclave only).
- Predictions on Future Load, Discussion leaders—north, A. G. Jones; south, R. A. Hopkins.
- Joint Meeting with Business Development Section, Discussion of Proposed New Wiring Methods—N. B. Hinson.

ADMINISTRATIVE SERVICES SECTION
M. W. Phillips, *Chairman*
E. A. Long, *Vice-Chairman*

THURSDAY MORNING, 10-12

CREDITS AND COLLECTIONS GROUP, Sponsor, Charles Davies.
- Customer's Deposits
- Cooperation between Companies on Follow-up Collection of Delinquent Accounts

TRANSPORTATION GROUP, Sponsor, P. H. Ducker.
- Company-Owned vs. Rental Equipment.
- Regulations of Motor Vehicle Code and Other Factors Affecting Transportation.

ACCOUNTING GROUP, Sponsor, L. W. Coughlin.
- New Classification of Accounts

PURCHASING AND STORES GROUP, Sponsor, Fred Hanson.
- Standardization of Catalogues.

CUSTOMER RELATIONS GROUP, Sponsor, C. E. Hewes.
- Customer Relations Audits.

THURSDAY AFTERNOON, 2-5

CREDITS AND COLLECTIONS GROUP
- Exchange of Credit Information
- Shut-off Policy and Procedure and Re-Connection Charges.
- Merchandise Accounts and Time-Payment Contracts.

TRANSPORTATION GROUP
- Authority of Interstate Commerce Commission Over Transportation.
- Standardization of Types of Vehicles.

ACCOUNTING GROUP
- New Classification of Accounts (continued)

PURCHASING AND STORES GROUP
- Standardization of Packages
- Standardization of Materials

CUSTOMER RELATIONS GROUP
- District and Branch Offices
- Customer Relations Aspects of Routine Activities

THURSDAY NIGHT, 6:30

WOMEN'S GROUP
- Dinner Meeting for Informal Discussion of Women's Programs.

FRIDAY MORNING, 9-12

GENERAL ASSEMBLY, ADMINISTRATIVE SERVICES SECTION

PERSONNEL GROUP, Sponsor, S. W. Scarfe.
- Improved Service Through Employee Training.

P.C.E.A. Regionals

Plans have been completed for the series of 12 regional meetings of the Pacific Coast Electrical Assn. to be held in various cities throughout the territory between October 30 and November 14. The schedule follows:

Santa Barbara, 6:30 p.m., October 30,
E. B. Cummings, local chairman
Elks Club

Santa Ana, 7:00 p.m., October 31,
R. E. Bacon, local chairman,
American Legion Hall

San Bernardino, 7:00 p.m., November 1,
H. J. Moulton, local chairman,
Mape's Cafe

El Centro, 7:00 p.m., November 2,
R. P. Moore, local chairman,
Hotel Barbara Worth

San Diego, 6:30 p.m., November 3,
L. M. Klauber, local chairman,
Hotel San Diego

Chico, 7:00 p.m., November 6,
J. H. Flagg, local chairman,
Hotel Oaks

Stockton, 7:00 p.m., November 7,
H. B. Heryford, local chairman
Hotel Stockton

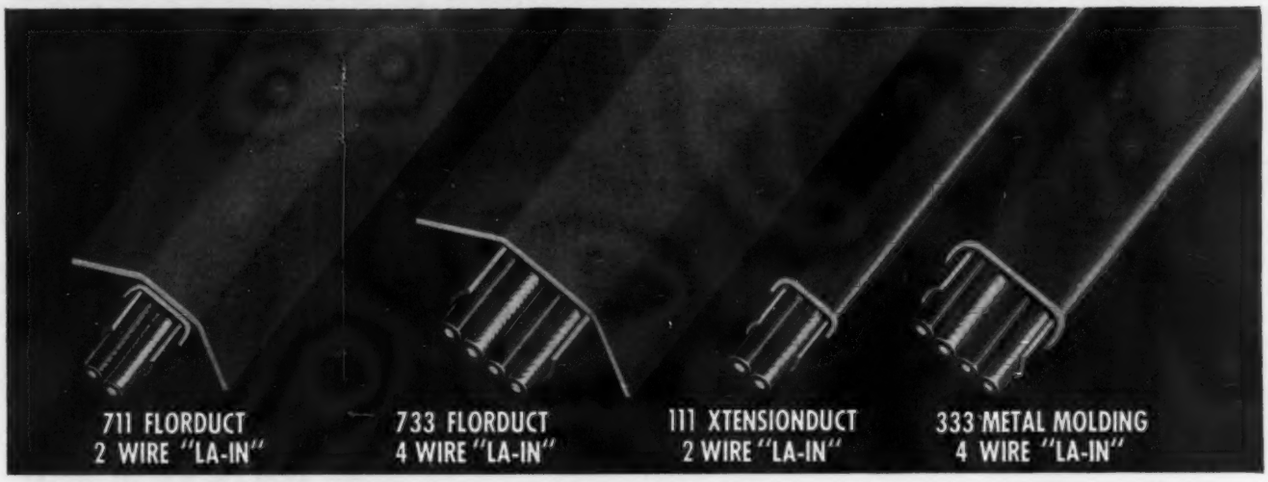
Petaluma, 7:00 p.m., November 8,
H. G. Ridgway, local chairman,
Hotel Petaluma

San Jose, 7:00 p.m., November 9,
I. B. Adams, local chairman,
Sainte Claire Hotel

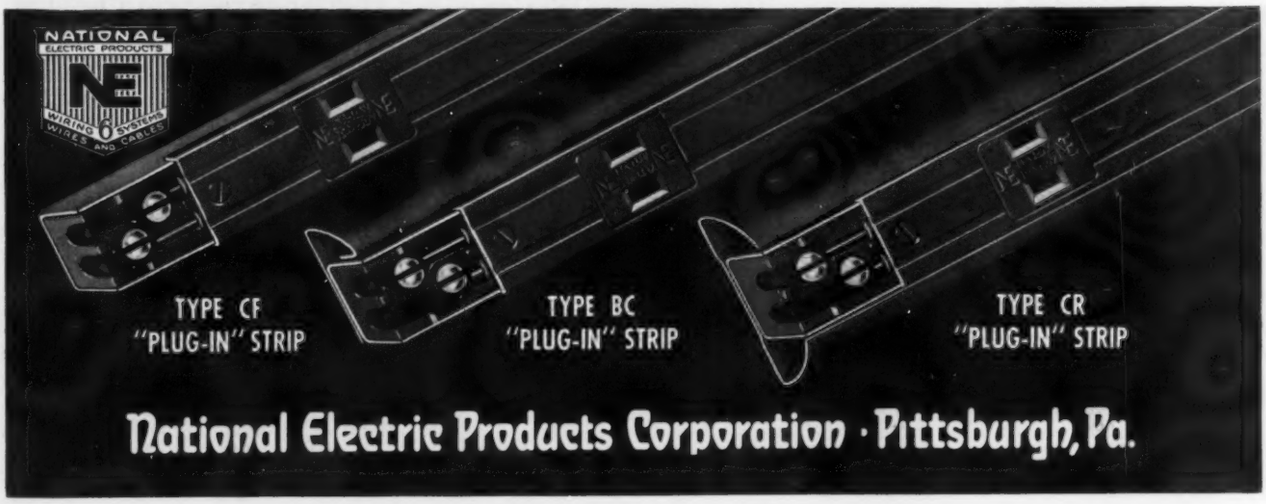
Watsonville, 7:00 p.m., November 10,
Frank Thomas, local chairman,
Resetar Hotel

Fresno, 7:00 p.m., November 13,
H. H. Courtright, local chairman,
California Hotel

Reno, Nevada, 6:30 p.m., November 14,
H. A. Lemmon, local chairman,
Golden Hotel



AND FITTINGS FOR EVERY REQUIREMENT



National Electric Products Corporation · Pittsburgh, Pa.

NEWS OF THE INDUSTRY

SAN FRANCISCO UPHELD IN HETCH HETCHY AGREEMENT

San Francisco's right to dispose of power generated in its Hetch Hetchy water project through an agency agreement with Pacific Gas and Electric Co. was upheld in a U. S. Circuit Court of Appeals' decision handed down Sept. 13. The decision reverses a U. S. District Court ruling under which the city had been found in violation of provisions of the Raker Act, had been ordered to dissolve the agreement and had been enjoined from disposing of its power. Suit had been brought initially by the U. S. government at the instigation of Secretary of the Interior Ickes. U. S. attorneys who prosecuted the case have indicated that they will ask the Supreme Court for a writ of review.

The government's attack on the power disposal agreement, which brings the city $2,000,000 in revenues annually, had been based upon provisions of the Raker Act which granted San Francisco certain water and power rights in Yosemite National Park for purely municipal purposes. The decision holds that the government's contention that the act prohibits the city from disposing of its power through the Pacific Gas and Electric Co. as its agent is without merit. The court shows that the Raker Act contains nothing with reference to the construction or acquisition of municipal water or power distribution facilities. It holds that the agency agreement is not to be construed as a sale of the power but is purely an agency contract both in intent and in fact.

Since 1927, the provisions of the Raker Act now defined by the court have been used as a reason for submitting municipal power distribution to the voters of San Francisco in eight elections. In every instance the proposals were defeated, the last time by a vote of 2.5 to 1 in May of this year.

P. G. and E. RECIEVES NEW SAN FRANCISCO FRANCHISE

Pacific Gas and Electric Co. seems assured of a new perpetual franchise for distribution of gas and electricity in San Francisco as the result of first passage by the board of supervisors of an ordinance calling for franchise rights upon the immediate payment of $475,000 by the company with annual payments thereafter of $160,000.

The new franchise agreement was demanded by the city on the grounds that the company's original state-granted franchise was for the distribution of gas and electricity for lighting only and that the bulk of the company's business is today in the power and heating fields. The $475,000 payment was taken into account in establishing the city's 1939-40 tax rate, about 8 cents of a 10-cent reduction being attributable to receipt of the company's contribution.

SERVICE was interrupted over scattered areas in central and northern California Sept. 11, 12 and 13 when freak lightning storms struck distributions systems along the Coast and in certain sections of the Sierra. Damage was largely confined to a few burned out transformers although many banks went out during the storms. A spectacular morning display over San Francisco, Sept. 13 was accompanied by heavy downpours. Load dispatchers and service men classed the weather as "highly unusual."

Meter Reading Under Fire!

The European war might never have begun had Ray Horn, meter reader in San Luis Obispo, been over there. Last month Horn was going about his duties peacefully, and among his assignments were instructions to read a meter at the California National Guard Camp at San Luis Obispo.

He found that artillery fire was under way upon his arrival at the camp and that the meter was in line of fire. For a moment he considered playing tag with flying 75mm. shells, but he decided that after all, he owed it to his office to report back.

Beating his way through sentries, sergeants, officers, aides-de-camp, flag-bearers, adjutant and brigadier generals and finally reaching the commanding general, Horn the civilian, Horn the citizen barked his command.

"Cease firing, general," he shouted. "I've got to read that meter."

Well, before you could spell lieutenant, guns ceased booming and Horn read his meter. After this noble recording, the barrage continued.

CITY OF SEATTLE PLANS CITY LIGHT EXTENSION

Seattle city officials plan a $1,000,000 bond issue for Seattle City Light to make extensions in the utility's system made necessary by increased public power usage and, in part, by rehabilitation of the Municipal street railway system. Superintendent of City Light, Eugene Hoffman states the money will be expended as follows:

Extensions to serve customers present and future, including a reserve fund for extensions $491,451; tie-in of South substation with Yesler substation, $68,224; stepdown transformers for Ballard substation, $40,178; increase transformer capacity at Fremont substation, $23,827; construction of outdoor substation at Laurelhurst, $46,256; construction of outdoor substation in Magnolia, $46,256; additional transformers for Hillman substation, $15,348; clear timber for Ruby Basin reservoir, $40,000; transmission line easements, $40,000; Gorge switching station, $28,016; construction of garages at Diablo, $11,000, miscellaneous construction $148,901.

Mayor Arthur B. Langlie has stated that none of the bond money will be used in any way to assist in construction of overhead trolley wires for the new transportation system. He also stated that the Puget Sound Power & Light Co., which has been furnishing 30 per cent of the power used by the street railway, will provide none for the new transportation system. The private company, he stated, has furnished part of the power because City Light did not have sufficient substation facilities.

WWP DECLARES NEW RURAL LINE CONSTRUCTION POLICY

A new rural line extension policy to bring electricity to thousands of Inland Empire farmers through a $1,000,000 construction program has been declared by Kinsey M. Robinson, president, Washington Water Power Co.

Construction of up to 2,000 miles of transmission line in the next three years is planned, according to Robinson. The lines, he stated, will not conflict with the REA plans.

First surveys for approximately 400 miles of line in Adams, Lincoln and Pend Oreille Counties have been completed and work will begin as soon as customers have signed agreements, it was stated. The construction program

is to be financed by $1,500,000 surplus from the company's recent $22,000,000 refunding operation.

Under the new policy, the company will build up to 2,400 ft. of line for a farm customer who agrees to pay a monthly minimum of $3 for electric service for the first five years. Cost of building lines further than 2,400 ft. will be paid in five annual installments, but if the customer makes "normal" use of the service this money will be refunded on the basis of his electrical bill.

Low cost construction of the proposed lines will be made possible, Robinson said, by the use of modern materials and methods. High strength composite copper and steel condustors permitting 10 or less poles per mile will be used, compared to 20 poles per mile for copper wire, he concluded.

Radio Interference Ordinance Adopted by San Francisco

A radio interference ordinance was adopted by the city and county of San Francisco Aug. 15. Rules and regulations to make the ordinance effective were set by Ralph W. Wiley, chief of the Dept. of Electricity, last spring.

The ordinance makes it a misdeameanor to continue to operate any electrical device, appliance, or equipment which produces high frequency electrical oscillations, or other electrical disturbances which interfere with the reception of radio signals, whether such interference is produced in privately owned radio receiving sets, or in equipment operated by police and fire departments of the city.

Infraction of the ordinance is punishable by a fine of $250, or by a jail sentence of not more than six months, or both.

Public Hearing Held on Benton County (Ore.) PUD Formation

Preliminary petition asking hydroelectric commission investigation of the feasibility of forming a public utility district in eastern Benton County, Ore., excluding the city of Corvallis, was found in order, and the state hydroelectric commission ordered a public hearing in Philomath, Sept. 28. The commission will make its investigation and issue its report on the proposal within 120 days after the hearing. If the report is favorable, the sponsors may then legally proceed to secure signatures for the final petition calling for an election within the district, which indicates that such election may take place in the spring of 1940.

Plain Hoss Sense
+ good basic quality
+ up-to-date design
= SUPERIOR
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★ ★ PRODUCTS
THE SUPERIOR SWITCHBOARD & DEVICES CO.
CANTON, OHIO
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METER & RELAY TEST SWITCHES
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EXTRA Values Speed Demand for the NEW CORY Coffee Brewer
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- New streamline design
- Wide-neck, easy to clean
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Free!

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At the N. Y. World's Fair, 910,000 cups of coffee were served at one eating place in 70 days with glass breakage of only 17 pieces! A triumph for CORY compact streamline design and special-formula CORNING glass. Stands up under HEAT and SERVICE. Modern and easy to clean! It has caught the public fancy.

BOTH FILTERS ARE SPEEDY! NO METAL! BREW MARVELOUS COFFEE AND TEA

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CORY Brewers and CORY Glass Filter RODS

Two outstanding profit makers—CORY Brewers and CORY Glass ROD Filters. CORY RODS fit other brands of glass coffee brewers and make them all glass. Brew superb coffee and tea untouched by metal. Selling in vast quantities at 50 cents. An extra value with all CORY Brewers. Other EXTRA CORY values are: Complete de luxe equipment included in price. Buyer gets: Hinged Decanter Cover, Combination Cover and Stand for Upper Glass, Measuring Cup. These fittings and easy grip Handle are in matching ivory-tone Bakelite or black Durez. Over 14 superiorities in all. WRITE for catalog.

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Long scales, exceptionally high accuracy and illuminated dials (if ordered) are some of the outstanding features of these instruments. Complete listings and technical details are given in Catalog P-48-a, which will gladly be sent on request.

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A companion line of 3" instruments is shown in this same Catalog. The 3" instruments are a little smaller than the 4" ones but have the same high qualities.

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Oregon State Hydro Commission Kept Busy With PUD Hearings

A public hearing on the proposed formation of a Public Utility District, comprising the city of Portland, Ore., was ordered by the state hydro-electric commission for Sept. 29. Pro and con evidence will be heard on this day with the hearing extending to midnight, if necessary, according to George W. Joseph, chairman of the commission.

This action was taken by the commission on Aug. 18 following certification of approximately 6,000 signatures on the preliminary petition requesting hydro-electric commission investigation of the proposal. In the meantime the commission will make its own investigation and within 120 days following the hearing will issue its report on the feasibility of the formation of the District. If the commission's report is favorable, the promoters, calling themselves the "Bonneville-for-Oregon Committee," may proceed to secure signatures on the final petition that will direct the commission to order an election. It is expected that such election may be called coincident with the state primary election in May, 1940.

This is the first attempt to form a district comprising only the corporate area of a city. The city's population is approximately 350,000 and it contains 392 voting precincts. It is served with electricity by Portland General Electric Co. and Northwestern Electric Co.

Wasco County PUD Certified

The hydro-electric commission of the state of Oregon, meeting in Portland Aug. 18, certified the formation of the Wasco County Public Utility District with the towns of Dufur and Mosier excluded, in accordance with the vote of the people of that county Aug. 15. Dufur and Mosier automatically excluded themselves by voting unfavorably on the proposal. The rural areas of the county and the city of The Dalles voted favorably, and the entire vote within the proposed district was favorable by a majority of 541. 2,929 votes were cast. All parts of the proposed district are now receiving service from Pacific Power & Light Co.

District commissioners of the newly formed PUD in Hood River County, excluding the city of Hood River, are said to have commenced negotiations with the Wasco County PUD and the PUD of Clickitat County, Wash., across the Columbia River, to join in an attempt to buy out Pacific Power & Light Co.'s system serving these three counties. The Bonneville administration has promised to run a 110 kv. transmission line from the plant up the south bank of the Columbia River to The Dalles, approximately 50 miles, if the Wasco County district was voted.

Hood River Taxpayers Sue

On Aug. 25, six taxpayers of Hood River County filed a suit in circuit court to enjoin the directors of the newly formed Hood River PUD from undertaking any business on behalf of the district. They asked that the district be declared illegal and void and that the provisions of the Public Utility District law as construed to vest the state hydro-electric commission with the power to create a district with boundaries varying from the proposed district as voted on by the people be declared unlawful, unconstitutional and void. In this case, the district as voted on included the town of Hood River along with populated rural areas of the county. The city voted unfavorably and the hydro-electric commission declared that the balance of the district excluding the city was legally formed and could proceed to do public utility business.

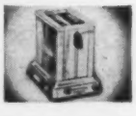
Adverse Report for Scappoose

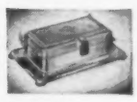
News of public utility district formation in Oregon during the latter part of August included an adverse report by the state hydro-electric commission on the proposed Scappoose district. In this farm area of Columbia County, west of Portland, the boundaries of the PUD were proposed to be practically coincident with a drainage district, members of which opposed the formation of the PUD. The commission's report held there would be no advantage to the drainage district in the formation of a PUD.

Coos County Petitions

Petitions are out in Coos County of southern Oregon looking toward the formation of a PUD in this county on the coast. Excluded from the district is an area around the city of Bandon which has its own municipal plant and certain thinly populated precincts in the eastern part of the county. Included is the Coos Bay area and the cities of Marshfield and North Bend now served by Mountain States Power Co.

CITY COUNCIL in Puyallup (Wash.) has passed an emergency ordinance appropriation measure to take care of the expense of a special election next November for the issuance of $350,000 of bonds, with which to purchase or condemn the Puyallup distributing facilities of the Puget Sound Power & Light Co.





UNIVERSAL CHRISTMAS MERCHANDISING: Here is a beautiful, 8 color window display that will draw Christmas Shoppers into your store. Shown with a display of UNIVERSAL Appliances featuring New Values and New Designs, it will move many UNIVERSAL Packages from your stock. UNIVERSAL'S new price arrangement will make it worth while as it provides an extra long profit.

This display is furnished complete with 500 beautiful Christmas booklets, for $2.50 with an order of UNIVERSAL Appliances, through your Jobber. This new profit schedule amply provides for your share of this small promotional expense.

Write for our complete Fall and Christmas Merchandising Plan.

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Amazing service record of Hotpoint Calrod electric ranges in U. S. Housing projects is verified by actual field reports from housing project managers employed by U. S. Government. • Federal Housing Administration has

CALROD • Because the heating unit is the vital element in the electric range, the greatest problem the electric range industry ever faced was to find a durable unit that would heat fast without burning out. After spending a tidy fortune and a score of years in persistent research, Hotpoint engineers perfected Calrod, the ideal heating unit.

After seven years of actual field service there are approximately 3,500,000 Calrod coils with Inconel Sheath and Glass Sealed Terminals now in use. Only 3,500 coils (one out of a thousand) have been returned to the factory *for any reason whatsoever.* And half of those had been operated on excessive voltage. There has been no sheath failure of any kind.

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Calrod differs from all other range units. Only Calrod sheaths are Inconel, the most durable metal known to science for this purpose. Only Calrod is hermetically sealed with fused glass which prevents oxidation of the coil and absorption of moisture by the insulation. Only Calrod continued to operate after 7,500 hours in E. T. L. tests—equal to 30 years' use.

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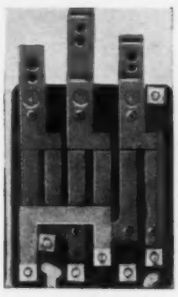
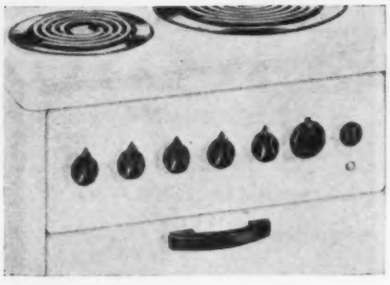
installed 8,004 Hotpoint Electric Ranges (each with 3 Calrod surface units) in 13 different housing projects throughout the U.S. • Of the 24,012 Calrod units (48,024 coils) only one COIL has failed in service. Better than 99 88/128% perfect performance at the hands of low income families in Slum Clearance areas. Such performance under severe usage is your assurance that you and your customers are best protected by Hotpoint.





1 **You can't wear out the new Hotpoint Switches.** Hotpoint research amazed the electric industry with its new Slow Make and Break Switches. Result is a switch that will operate for years without failure. Severe laboratory tests have proved this durability. Field use verifies it.

Hotpoint engineers claimed 60,000 cycles for their new switches under full range load. Electrical Testing Laboratories, with independent tests, proved that 68% of the new Hotpoint switches tested by them passed 200,000 cycles under 20 amp. load. Equal to nearly 50 years of normal use.

All Hotpoint ranges are completely equipped with these remarkable Hotpoint-built switches.

2 Hotpoint introduced the 5-Heat Switch with Slow Make and Break Contacts and again raised the Standard of Electric Range Performance. Hotpoint leadership means more to you than a mere term. It makes sales easier.

3 There are approximately a quarter million of Hotpoint's new switches in use today. Their performance is 99.92% perfect—setting a new high standard for long life in switches. There is no need to ask your customers to be satisfied with less.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5612 West Taylor Street, Chicago, Illinois

Over ⅓ of all electric ranges in use today are Hotpoint—far more than any other make. For more than 30 years Hotpoint has led the industry with research, engineering, electric range improvements. Hotpoint means advanced features. The name Hotpoint on an electric range is a great sales asset. It's easier to sell Hotpoint than to sell against it.

Electric Ranges

REFRIGERATORS • WATER HEATERS
DISHWASHER-SINKS • WASHERS and IRONERS

Hotpoint offers a lively new Christmas sales plan. Use it to cash in on the momentum gained in the big Range Exposition Campaign. Get all details from your Hotpoint Distributor or District Representative.

IES Member Flies Own Plane to Convention

E. H. Lauth, chief engineer, Daybrite Lighting, Inc., St. Louis, is also a major in the Missouri National Guard and in command of the 110 Observation Squadron, with headquarters at Lambert's St. Louis Municipal Airport.

So, with an all metal, midwing monoplane, he zoomed last month to the IES convention at San Francisco, accompanied by two enlisted men, one a mechanic and one photographer, both members of the St. Louis unit. First stop was made at Los Angeles, which was reached in nine hours and ten minutes. Then Lauth clocked himself from Long Beach to San Francisco in one hour and forty-five minutes, an airline distance of 380 miles.

Before landing at Hamilton Field, San Francisco, his photographer took interesting pictures of the Bay area.

On the return flight to St. Louis from Oakland Airport, the fleet plane covered the 1835 miles in eight hours and forty-five minutes, with average speed of 229 miles an hour. Lauth flew at an altitude of 15,000 ft., using oxygen most of the way. Stops for gasoline were made at Salt Lake City, Cheyenne and Kansas City.

A PLAN for reorganization of the Mountain States Power Co., under section 77B of the bankruptcy act, has won approval of the United States district court of Delaware, and notice has been mailed to creditors and stockholders that acceptances must be filed with the company at its offices in Albany, Ore., by Oct. 14.

Venture Voters to Pass Upon Electric Distribution

General obligation bonds amounting to $1,200,000 for constructing or acquiring an electric distribution system will be passed upon by the voters of Ventura, Calif., at the November 7 election. On the same ballot will be a charter amendment authorizing the issuance of revenue bonds to engage in utility operations. The general obligation bonds will require a two-thirds majority to pass; the charter amendment a simple majority. Ventura is served by the Southern California Edison Co.

GEORGE W. SWEENY, managing director, Neon Products of Western Canada, and Ruddy-Duker Ltd., billboard company, was elected director of the Poster Advertising Assn. of Canada at the recent convention in Brockville, Ont.

Electric Rate Reductions Made Throughout Western States

Domestic and commercial rates of Coast Counties Gas & Electric Co., are to be reduced $180,000 annually, President Ray C. Wakefield of the California Railroad Commission stated last month. He expected the new, lower rates could become effective on October 15. Before that time the new schedules will be announced so that each customer can ascertain his individual savings.

Of the total reduction, $80,000 will be in electric rates and the remaining $100,000 in gas charges. Santa Cruz, Watsonville, Gilroy, Hollister, Aromas, San Martin, Soquel, San Juan and Morgan Hill will share in both the electric and gas rate reductions.

"This is the third successive annual reduction in rates of this utility brought about by the Railroad Commission's policy of continuous investigation," Wakefield said. "Last year rates were reduced $100,000 on an annual basis, while in 1937 the reduction was $128,000. These reductions, totaling $408,000 on an annual basis in the last three years, have been worked out with the complete participation of the company in conferences without the necessity of formal rate cases."

Wakefield explained that the rates would be developed by engineers of the Railroad Commission and that any suggestions the municipalities served by the company desire to make will be given consideration. Engineers of the Commission staff are to meet in the near future with Charles Grunsky, chief engineer, Coast Counties Gas & Electric Co., in a preliminary conference on the spreading of rates.

San Diego Consolidated

Reductions in gas and electric rates of San Diego Consolidated Gas & Electric Co., totaling $230,000 annually, are to be made according to Ray C. Wakefield of the California Railroad Commission, following completion of investigations of the company's operations. Of the total amount $105,000 annually is to be in savings in gas bills and the remaining $125,000 will be in charges for electricity. The new rates will become effective November 1.

"This reduction of $230,000, the Commission estimates, will reduce the company's rate of return to slightly under 6.5%. This is in fact the second rate reduction this year as on Jan. 1, 1939, a reduction in electric rates totaling $168,291 became effective," Wakefield said.

Since completion of the report the

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Commission has been in conference with executives of the company. Likewise today a conference was held with city attorney Dayton L. Ault and rate expert Walter Cooper, representing the city of San Diego.

Utah Power & Light

Effective Sept. 1, electric rates of the Utah Power & Light Co. were cut to a new low. Ordered by the Public Service Commission, the new low rates run 75c each month, a minimum bill, which entitles the consumer to use 10 kw.-hrs. Four cents per kw.-hr. is charged for the next 50 kw.-hr. of monthly consumption, and 2.5c for the next 140 kw.-hr., and 1.5c for additional monthly consumption.

All residential and farm customers are affected by the new rates, which will not only mean great savings, but will mean greater use of electricity in the future. A leaflet entitled "Again—the Cost of Electricity Goes Down," is being distributed by the power company, outlining facts about the new rates.

West Coast Power

Rate reductions for domestic and commercial business of the West Coast Power Co. in the Grant County division in central Oregon and the western division, along the Oregon coast, were authorized by the public utilities commissioner of Oregon to be effective Sept. 15. The reductions will save the company's customers approximately $2,000 in the Grant County area—Canyon City, Prairie City and John Day—and about $20,000 in the coast area including Waldport, Yachats, Florence and Reedsport.

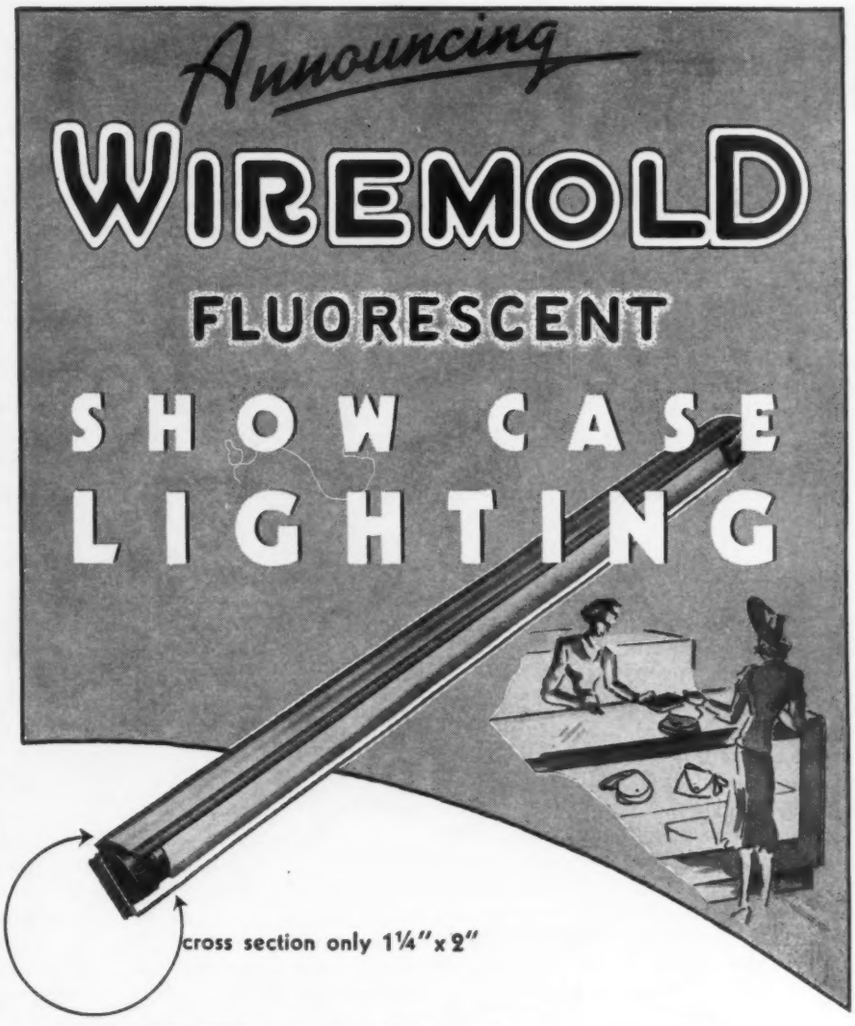
In both areas the reduction amounts to approximately 10%. In central Oregon the new rates, both domestic and commercial, start at 8c and drop to 2c. In the coast area, the top step is 7c and the bottom step, 2c.

Albuquerque Gas & Electric

Lower lighting rate schedules by the Albuquerque Gas & Electric Co. went into effect Sept. 1, according to Arthur Prager, vice-president and general manager of the utility. In a full-page ad in the Albuquerque *Journal*, the company made known its exact rates.

For the first 30 kw.-hr. per month, in residential rates, 6½c per kw.-hr. is to be charged, with 5c set for the next 30 kw.-hr.; 3½c for the next 30 kw.-hr. and 3c for excess kw.-hr. per month. Minimum charge will remain at $1.25 per meter per month.

These reductions will mean a saving of $41,000 to residential customers, and $44,000 to commercial customers, according to the statement.



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- *Assembled "on the job"* from unit parts designed to fit standard cases or equally adaptable to special installations. May be interconnected with standard Wiremold Wiring Systems.
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FPC Approves New Bonneville Rates; Other Project News

The Federal Power Commission last month approved new rate schedules for Bonneville power which will enable districts, cities, utilities and industries to buy power to meet their immediate needs. For the past two months the Commission has been studying proposals for "monthly" and "dump" power sales, which are intended to encourage early utilization of nearly all power available at Bonneville Dam.

Most important of the new schedules submitted by Acting Administrator F. A. Banks permits purchase of power on a monthly basis at a cost of ¼c per kw.-hr., plus a demand charge of 75c per month per kw. This schedule is designed especially to meet the requirements of smaller districts, such as Hood River, which are likely to operate at a low "load factor" at first.

A considerable number of districts and cities, as well as private utilities, have been awaiting approval of the new monthly schedules. By allowing these systems to take the power they need from month to month, the schedules will permit most economic utilization of existing generating facilities. Most of the municipal electric systems in Oregon and Washington already have hydro or diesel plants and are asking for Bonneville power to meet their peak requirements.

The schedules approved by the commission retain with slight changes the uniform rate of $17.50 per kw.-hr. for firm power everywhere on the Bonneville network, and $14.50 at damsite. The "kilowatt-year" rate—hailed as the lowest wholesale schedule in the nation—will be cheapest for districts whose load factors are 40% or more. The new monthly rate will be more economical for sparser districts and newer systems whose load factor is less than 40%.

To make maximum use of the energy available at Bonneville, the Commission has approved a flat rate of ¼c a kilowatt-hour for "dump" power.

"The new rate schedules will help market Bonneville power more rapidly, as they will permit customers to buy exactly the energy they need," Banks said. "Communities will be encouraged by these to build their loads quickly, so they can take advantage of the 'kilowatt-year' schedules.

"I believe the revised rates will eliminate many of the doubts and end much of the delay in the submission of applications for power and in the signing of contracts," the Bonneville chief said. "Our first lines to Vancouver, Portland, Salem and Eugene will be completed before the end of the year, and we will be in a position to quote rates to meet all power needs. Newly formed public districts and existing municipal systems require these new rates, which have been designed in accordance with the Congressional policy of giving preference in the sale of power to non-profit and cooperative distributing agencies."

Creim New Engineer

Ben W. Creim last month was named principal engineer in charge of project construction, according to acting administrator Frank Banks. For the past three years, Creim has been principal engineer for REA, in charge of design and construction of all rural systems in 11 Western states.

Creim spent from 1919 to 1927 as electrical engineer in charge of substations and power house testing for the Bureau of Power & Light, Los Angeles. Later he was consulting engineer for Tulare City, Calif., and chief electrical engineer of the Modesto irrigation district. He also taught electrical engineering at the University of California.

Power Lines Bids

Bids on construction of a 46-mile, 110,000-volt power circuit across Lewis and Pacific Counties to Raymond, Wash., will be opened October 6, at the Bonneville project's Portland offices.

It will be the seventh major line construction contract offered by Bonneville this year. Others are the "backbone" line from Bonneville to Vancouver, the Vancouver Eugene line, the Bonneville-Grand Coulee line, the Bradford island crossing, the Columbia-Willamette river crossing and the Vancouver-Kelso-Chehalis line.

Invitations to contractors, issued today, specify that the new line will be constructed of western red cedar poles and douglas fir crossarms, to be provided by the government. The poles, set in pairs to form H-type frames, will carry 138 miles of conductor cable capable of carrying a radial ice loading of half an inch.

The new Bonneville circuit will begin at a substation to be erected three miles south of Chehalis, Wash., on the right-of-way of the Vancouver-Kelso-Chehalis line, bids for which were opened September 13.

From Chehalis, it will cross Lewis and Pacific counties in a westerly direction, passing along the southern boundary of Pe Ell and near the smaller communities of Curtis, McCormick, Walville, Pluvius, Lehom and Frances.

At Raymond, the new line will be tied into a substation which will be used to step down its high tension current to voltages low enough for delivery to public utility districts, municipal, cooperative or private distribution systems in the upper Grays Harbor region.

Nearly 1000 poles ranging from 50 to 90 ft. in length will be required for construction of the line. Erection will begin within 10 days of notice of the contract's award and is to be completed about four months thereafter.

Raver Appoints

One of the first official acts of Dr. Paul J. Raver, new Bonneville administrator, on taking over the office in Portland, Sept. 18, was the appointment of two men who had been with him in the Illinois Public Service Commission, to key positions at Bonneville. D. L. Marlett was given the post of technical assistant to the administrator, effective immediately. Warren H. Marple took charge of the administration rural electrification department, Oct. 1.

Marlett is a native son of Portland, where he received his grade school education. He is a graduate of the University of Wisconsin and Northwestern University and is a certified public accountant. For the past two years he was administrative assistant to Dr. Raver in the Illinois Commission.

Marple is a native of Seattle and a graduate of the University of Washington and Harvard. He was executive secretary of the Illinois Rural Electrification Committee.

Vancouver-Kelso Line

Construction of the Bonneville Project's 220,000-volt power line between Vancouver and Kelso will cost close to $200,000, according to bids opened Sept. 13. This is the first link of the circuit which will bring Bonneville power into the Puget Sound area.

Contractors' offers on the 41-mile

FRIENDLY METALS

Copper and iron, copper and zinc or other dissimilar metals in contact create galvanic couples particularly active in the presence of soil electrolyte. The copper-to-copper contact of a copper grounding wire clamped to a Copperweld ground rod with a Copperweld clamp assures friendly metals in contact under the ground.

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"BEARING DOWN"
to make sure they will STAND UP

This A.I.E.E. porosity test* is only one of the many routine and design tests we make on Victor porcelain before it is shipped to our customers.

The 100,000 lb. Rhiele testing machine illustrated above is only one of the many devices in our laboratory, equipped to prove, mechanically and electrically, every piece of porcelain we produce.

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steel-tower circuit ranged from $185,837 by H. H. Walker of Los Angeles to $266,745 by Parker-Schram Co. of Portland. Other bids: Fritz Ziebarth, Long Beach, $218,765; Electric Construction Co., Seattle, $220,349; and a combination bid of $225,600 by the Acme Construction Co., the West Coast Construction Co. and Macri Brothers, Seattle.

Steel for the 191 towers and 123 miles of power cable will be provided for the work by the Bonneville Project, under a separate purchase contract. Construction, involving excavating and building tower footings, erection of the towers and stringing the conductor, will be handled by the contractor under terms of the opened bids.

When complete, the line will pass near LaCenter, Kalama, Salmon Creek, Pleasant Valley, Good Hope, Pioneer and other communities. From its terminus at a substation in Kelso, lines will be run north through Chehalis to the vicinity of Seattle and westward to the Pacific Coast to new utility districts and companies in the Grays Harbor area.

PUD Condemnation Proceedings Must be Voted Upon Says Court

Public utility districts may not buy existing utilities without submitting the question to a vote of the electorate, according to a recent decision of Judge Charles W. Hall, Vancouver, Wash. The ruling also enjoined the Grays Harbor PUD from purchasing property of the Grays Harbor Railway & Light Co. for $2,842,000. John Bayha, an Aberdeen taxpayer, brought the suit and the city entered litigation to stop the purchase. It was indicated the case would be appealed to the Supreme Court.

DOMINATED BY A gigantic table lamp, with an information booth at its base, the British Columbia Electric Railway Co. staged a large and attractive display at the Canada Pacific Exhibition. The lamp weighed four tons, and was illuminated with fluorescent units. It stood 23 ft. high with a shade 15 ft. in diameter.

COLORADO RIVER COMMISSION of Arizona has filed a brief urging the Federal Power Commission to grant the state of Arizona a preliminary permit for a lower power project at Bridge Canyon.

H. V. WINGFIELD, of the U. S. Indian Service at Los Angeles, has been appointed to succeed H. E. Bixby as electrical manager of the Indian Service in the lower Flathead Valley, Montana.

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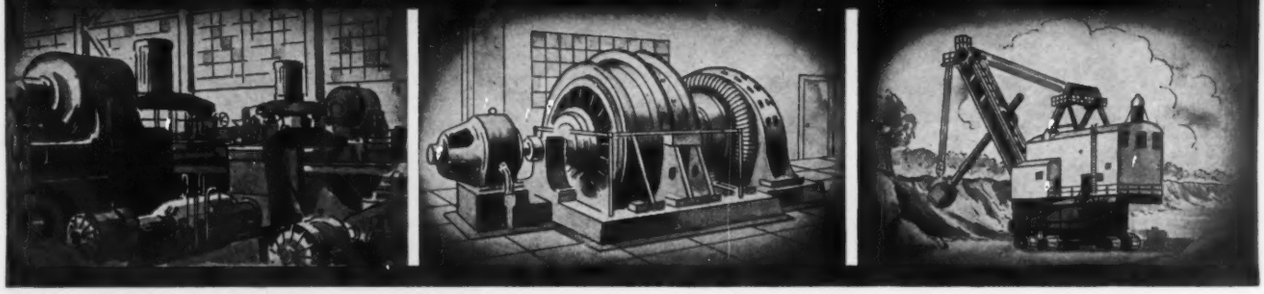
FOR EVERY FIELD OF INDUSTRIAL SERVICE



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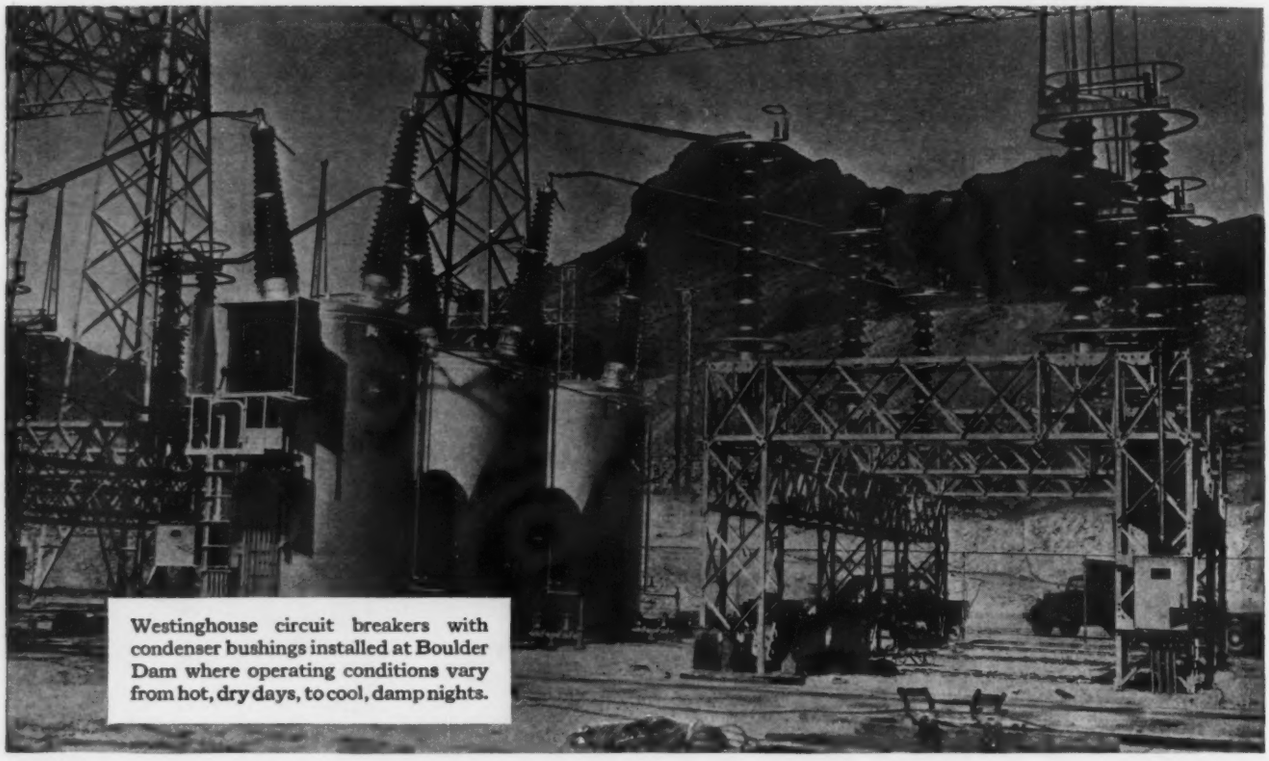
NEW BUSHING



Westinghouse circuit breakers with condenser bushings installed at Boulder Dam where operating conditions vary from hot, dry days, to cool, damp nights.

Advantages of Condenser Type Construction Proved by Laboratory Tests

The two 23 Kv. condenser bushings illustrated here have been operated for more than a year at 65% over voltage with water on top of the new plastic filler. To date, no change has been detected in the power factor, demonstrating the waterproof quality of the Westinghouse filler.

★

Heated to 180° F. and then plunged into dry ice at a temperature of −50° F., this test proved that the weatherproofing features of the condenser bushing are not affected by the severest changes in operating temperature.

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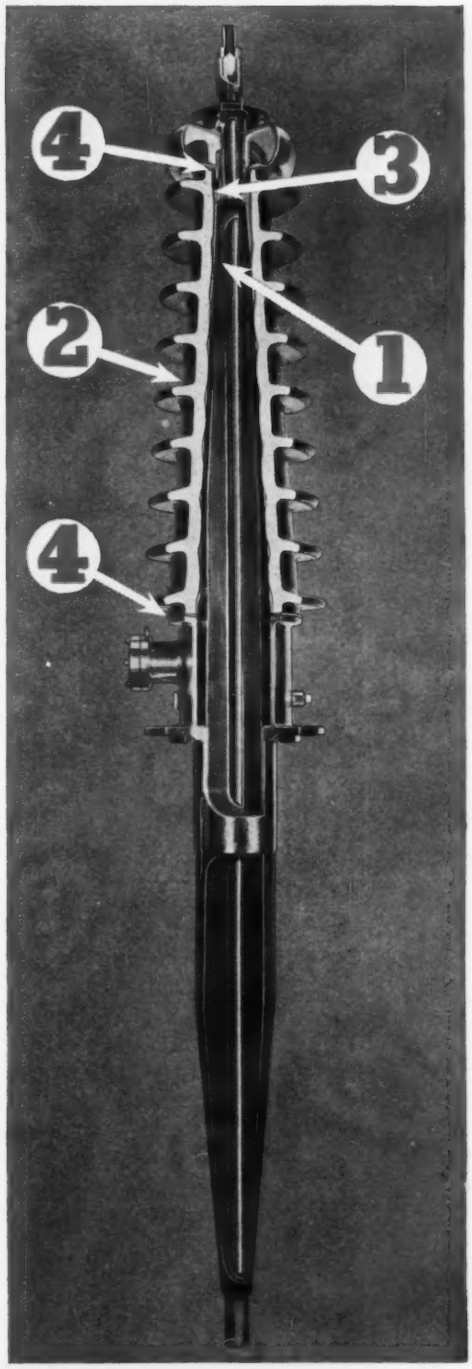

For 30 years Westinghouse Condenser Bushings have established unequalled records for long life and trouble-free performance. Now, through continued Westinghouse research and engineering, these bushings have been given four-way protection — protection that results in still greater dependability — still greater freedom from maintenance.

1 NEW INSULATION TREATMENT

A new system of processing, developed by Westinghouse Research Laboratories, is now the bushing insulation's first protection against moisture. In laboratory tests after 1500 hours of complete immersion in water, the condenser of the bushing had not absorbed sufficient moisture to make it inoperative.

2 PORCELAIN HOUSING

The bushing's second protection is a wet-process porcelain housing ... porcelain made by Westinghouse in its own porcelain plant to assure flawless construction.

3 NEW PLASTIC FILLER

The space between the porcelain housing and the condenser is filled with a new plastic filler which, because it is heavier than water and will not emulsify with water, prevents any possible condensation from reaching the insulation.

4 HIGH-PRESSURE GASKET SEALS

"Pressed-on" fit is secured for main bushing flange by huge hydraulic presses. The correct pressure is maintained on special resilient gaskets at both ends of the porcelain housing, regardless of temperature changes, by ingenious mechanical construction and gasket stops. Two to five tons pressure is exerted in the assembly of these joints.

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This 4-way protection assures maximum performance and low maintenance cost for Westinghouse circuit breakers and transformers. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania, Dept. 7-N. J-60338

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Toastswell is breaking sales records every day with the biggest automatic toaster value on the market. No other toaster is available in 2 and 4 slice capacity and at their low list prices, Toastswell Automatic Toasters will sell in volume.

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ELECTRIC BUN . . . ROLL . . . and FOOD WARMER

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TOASTSWELL takes the load in the bun, roll and food warmer field with two magnificent food warmers that are really useful and practical electrical appliances. Made in two designs to fit your entire trade, these Toastwell electric bun, roll and food warmers are built to hold your customers and net you a handsome profit.

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Tacoma City Light to Get Government Contracts

The Tacoma City Light Department expects to include as a large industrial customer the U. S. Government's new barracks at Fort Lewis, near Tacoma. Secretary of War has approved of the use of electric cooking and water heating in all new officers' quarters, and electric equipment will be installed as soon as bid calls are completed. No competition to City Light's bidding is expected.

The city will establish a substation costing $50,000 on the Government reserve near Camp Murray, which will require four months to complete. At present Fort Lewis is using about 1200 kw. McChord Field will take about 50 kw. and the total load will run about 2,000 kw., Verne Kent, City Light superintendent stated.

A CONTRACT has been closed by the EHFA with the city of Banning, Calif., providing that the Authority and the utilities will cooperate in financing the sale of electric appliances for use by consumers located on the utilities' power lines.

Graybar to Supply Tacoma With Insulators

The Graybar Electric Co., on a bid of $6,090, secured contract to supply the Tacoma City Light Department with 5,000 high line insulators. The Board of Contracts and Awards is receiving bids for $100,000 worth of equipment for the 110,000 volt transmission line to be strung between the Cushman substation and the Tideflats substation. The line will furnish the industrial area with almost double the amount of power now available, and will involve seven miles of new construction, and nine miles of reinsulating for the heavier load.

Glendale To Construct $1,800,000 Power Plant

Authorization for the construction of a $1,800,000 steam-powered electric generating plant at Glendale, Calif., was given recently by the City Council. Peter Diedrich, superintendent of the Public Service Department, told the Council that the department had a reserve fund of $1,642,000 to start the project, which will require two years to complete. Complete plans for the plant were drawn up last year when a Federal appropriation was requested.

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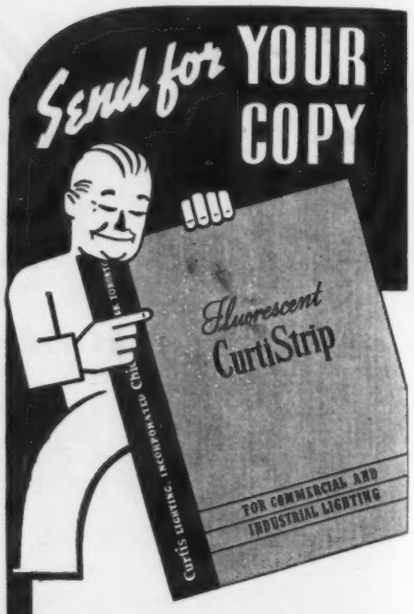

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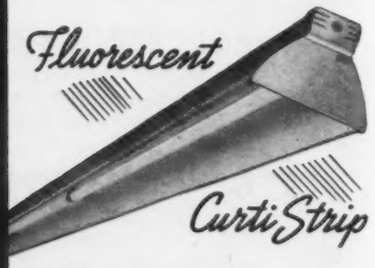

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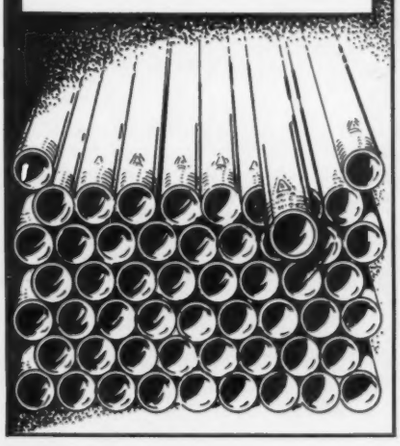
Play Safe — Specify Triangle!!!

ELECTRIC METALLIC TUBING
Hot Dip Galvanized!

PLUS a baked-on lacquer finish inside and outside!

RIGID CONDUIT
Hot Dip Galvanized!



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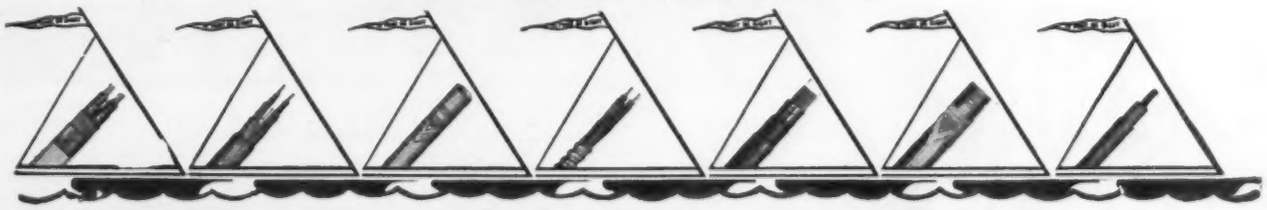
(Double Bushed)

Only Triangle gives you hot dip galvanized armor!

It Costs No More!

TRIANGLE PRODUCTS REWARD BUYERS!



TRIANGLE CONDUIT & CABLE COMPANY, INC.

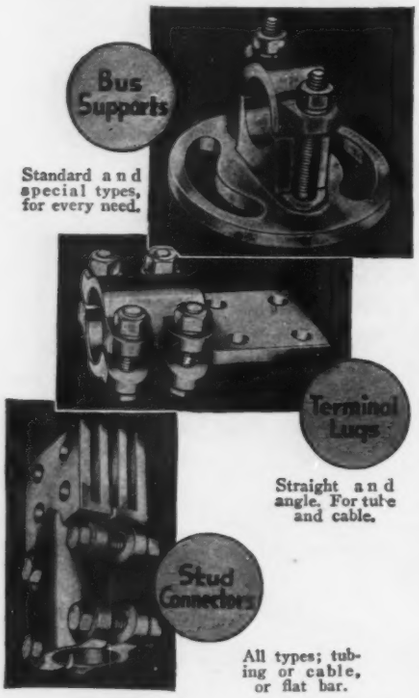
Horace Harding and Queens Blvds.
Elmhurst, New York City, N. Y.

Pacific Coast Division: C. C. Hillis, Vice-President in Charge of Sales, 390 Seventh St., San Francisco, California

Preferred *because they are* **Dependable**

The leading utility companies and "industrials" use PENN-UNION fittings to make certain of *dependable* connections.

They know that *every* Penn-Union fitting is carefully designed and manufactured . . . thoroughly tested.



Standard and special types, for every need.

Straight and angle. For tube and cable.

All types; tubing or cable, or flat bar.

These fittings are high conductivity copper alloy, with machined contact surfaces.

More than 6,200 items in the Penn-Union line . . . for every type of electrical connection . . . including many NEW and IMPROVED fittings. Write for Catalog.

NICHOLAS & COOK
1063 HOWARD STREET
SAN FRANCISCO

J. W. WATKINS
538 SKINNER BLDG.
SEATTLE

PENN-UNION ELECTRIC CORP., Erie, Pa.

You'll find it in the *complete* line

PENN-UNION
Conductor Fittings

REA Activities

Northern Idaho Rural Electrical Rehabilitation Assn., Inc., Sandpoint, Idaho, has been awarded $196,000, of which $46,000 will be used to build about 28 mi. of line to serve Bonner County, and $150,000 will be used for the construction of a generating plant.

Yellowstone Valley Electric Cooperative Inc., Huntley, Mont., has been allotted $10,000 for wiring.

Sanders Electric Cooperative, Inc., Trout Creek, Mont., has been allotted $5,000 for wiring.

Missoula Electric Cooperative, Inc., Missoula, Mont., has been awarded $10,000 for wiring.

San Miguel Power Assn., Inc., Norwood Colo., has been allotted $5,000 for wiring.

Clearwater Valley Light & Power Assn., Inc., Lewiston, Idaho, has been awarded $10,000 for wiring.

Contracts Awarded

To O. A. Carlson, Seattle for construction of elec. distribution and street lighting system at Fort Lewis and McCord Field, Fort Lewis, Wash., $189,613.

To John A. Roebling Sons & Co., for 60,000 lb. of round groove trolley wire for municipally owned street railways system by Seattle Municipal Transportation Commission. Also 56,000 lb. of feeder wire. To General Electric Co., General Cable Corp. and Bridgeport Brass Co., each one-third of the balance of approximately 1,000,000 lb. of trolley wire.

To J. M. Hooper Electric Co., Seattle, for installation of lighting system in Stacy and Lander st. transit sheds, $3,199.

To C. E. Atwater & Co., Amarillo, Texas, for construction of 37 mi. of line for the San Luis Valley Rural Electric Cooperative, Inc., Monte Vista, Colo.—$37,509.

To Collier Electric & Radio Co., Denver, for construction of 92 mi. of line for Intermountain Rural Electric Assn., Bailey, Colo. $86,633.

To E. A. Reither, Aitken, Minn. for construction of 271 mi. of line for the Union Rural Electric Assn., Brighton, Colo. $164,339.

To O. A. Carlson, Seattle, for building another section of the project of the Clearwater Valley Light & Power Assn., consisting of 105 mi. of line, $88,038.

To Homer G. Johnson, Portland, for building 73 mi. of line of Fall River Rural Electric Cooperative, Ashton, Idaho, $51,210.

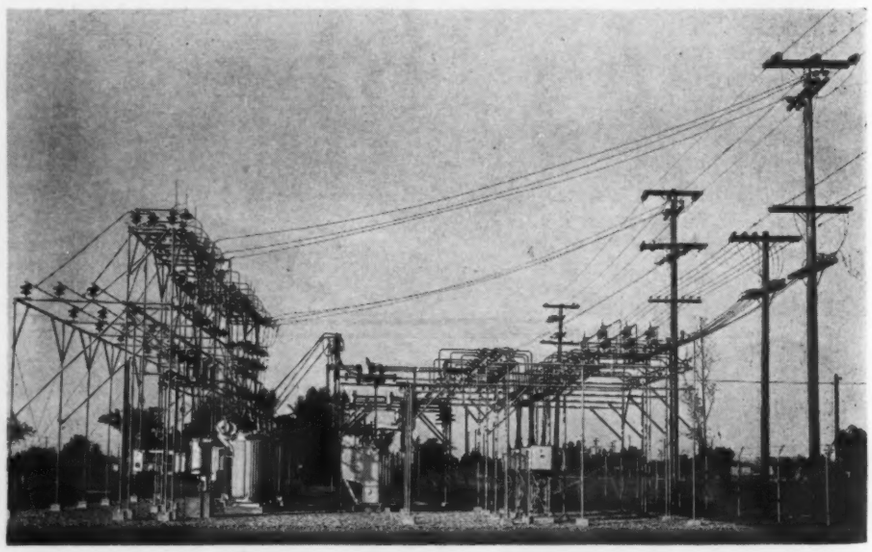
To J. L. Tribe, Sandpoint, Idaho, for installation of 52-unit light curb system in Grangeville, Idaho, $6,630.

To Franzen Bros., Palisades, Minn., for construction of 160 mi. of transmission lines north and south of Pullman, Wash. for the Inland Empire Rural Electrification project., $121,370.

Ne Page Electric Co., Seattle, for installation of lights on new Ballard Bridge, Seattle, $28,738.

To Clyde W. Wood, Los Angeles, for excavations for the new hydroelectric plant of the U. S. Reclamation Bureau at Parker Dam, $276,210.

To General Electric Co., for transformers for a new cross-town transmission system in Tacoma, $53,184.



New Station in Imperial Valley

In Imperial Valley, additions to the Irrigation District's 33 kv. loop have been going forward. Recently completed by H. O. Bauerle, Los Angeles contractor, in 60 days, at a total cost of $150,000, were four stations, at Holtville, Calexico, Imperial and Calaptra. This one is typical of the four. Each is equipped with R.I.&E. automatic air break, 33-kv. switches, with time closing motors, three 500 kva., single phase, 4-kv. transformers, and voltage regulators for city loads, and one 500-kva., 3-phase, 4-wire, 11-kv. transformer and regulator for rural electrification. All are 90 per cent automatic and require no attendants.

TRADE NOTES

CUTLER-HAMMER, INC., has expanded its operations in the Intermountain territory by increasing personnel, facilities and stocks of its Denver office to cover its complete line. H. L. Vaughn, Denver representative, stated that his office is now equipped to provide full service in every sense on all Cutler-Hammer products.

THE BRISTOL CO.'s equipment will be exhibited at the 1939 Dairy Industries Exposition to be held in San Francisco, Oct. 23-28. Dairy recording and control instruments will be featured, with the following representatives in attendance: R. G. Tower, Pacific Coast district manager; H. E. Beane, field sales manager; W. H. Rogers, Los Angeles district sales representative; J. W. Peckham, Seattle district sales representative; O. C. Abbott and G. P. Fairbanks, salesmen.

WESTERN DISTRICT OFFICES of the Anaconda Wire and Cable Co. have been moved to 111 Sutter St., San Francisco. These offices will be headquarters for all Anaconda operations in the 15 far Western states. Ed Casey, recently appointed Western states manager, and Lee Lethine, San Francisco district manager, will be located there.

SPOKANE ADEQUATE WIRING BUREAU has named P. L. Heydon, secretary of the Spokane Electrical Contractors' Assn., as chairman, with H. L. Vincent, Westinghouse Electric & Mfg. Co., vice-chairman. H. C. Bender, Washington Water Power Co., remains secretary-treasurer.

SMALLCOMB ELECTRIC CO., Los Angeles, has been appointed Peerless Fan and Blower distributors in Los Angeles County.

SUBSTANTIAL REDUCTIONS on various commodities for east-west less-than-carload shipments are listed in new tariffs just released by the National Carloading Corp., according to Mitchell Howe, divisional manager for the Pacific Coast. Many electrical concerns of all kinds enjoy the savings in time and money made possible by the coordinated network of transportation facilities offered by National Carloading Corp. Less-than-carload shipments are picked by National at factories and shipped to Chicago for consolidation into daily through cars to various West Coast terminals.

GREENLEE HAND TOOLS *for Economical Electrical Construction*

Bending Rigid Conduit With a Greenlee

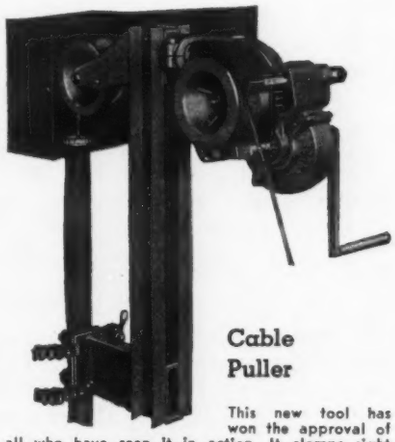
By using Greenlee Timesaving Tools for bending conduit, enlarging knockouts, pulling cable, pushing pipe, and other operations, much can be accomplished in the way of efficiency. But that isn't all. In most cases it means that better work will be done on each job.

We know all this to be true because so many users of Greenlee Tools have told us so. In fact many have said that certain of these tools have more than paid for themselves on the very first job.

Hydraulic Conduit Benders

Greenlee Conduit and Pipe Benders are timesavers from the word go. Not only do they do the job in a hurry, but they make a smooth, even bend, and they save the cost of many manufactured fittings.

The rigid-conduit bender, shown above, is made in two sizes for conduit from 1¼ to 3-inch and from 3 to 4½-inch. The smaller bender can also be fitted with a set of attachments for bending 1¼, 1½ and 2-inch thin-wall steel conduit.



Cable Puller

This new tool has won the approval of all who have seen it in action. It clamps right to the conduit through which cable is to be pulled. Can be used in any position, is readily portable and has two operating speeds.

Do You Have a Copy of Catalog No. 31-E?

This catalog illustrates and describes the Greenlee line of tools for electrical construction, including all those listed in the coupon below. If you have a copy it will pay you to study these tools carefully. If not ask for one now. You will find that it points the way to faster and better work on every job.

GREENLEE TOOL CO., 1703 Columbia Ave., Rockford Ill.

Use this Coupon and Save Time

GREENLEE TOOL CO., 1703 Columbia Ave., Rockford, Ill.
Please send information on the following tools:

☐ Conduit Benders ☐ Radio Chassis Punches ☐ Bit Extensions
☐ Cable Pullers ☐ Joist Borer ☐ Pipe Pushers
☐ Knockout Tools ☐ Electricians' Bits ☐ Send Copy of Catalog 31E

Company ..... Address .....
City ..... State .....
Our Jobber is ..... W 10-39

CHROMALOX

RANGE UNITS

and their sales-boosting list of exclusive features. Sell ranges equipped with Chromalox Super Speed Range Units. Write now to our nearest distributor for all details.

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911 Western Ave., Seattle, Wash.
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420 S. San Pedro St., Los Angeles, Calif.
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We take pleasure in

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the appointment of

Condon & Young, Inc.
357 So. Hill St.
Los Angeles Calif.

As Representatives for Southern California

and of

Geo. E. Honn Co.
420 Market St.
San Francisco Calif.

As Representatives for Central California

—of—

Bierce "Sure Grip" Guy Wire Protectors
Bierce Tubular "Sure Grip" Guy Guards
Bierce Cone Anchors
Bierce Plate Anchors
"Standard" Telescopic Earth Augers

The Specialty Device Co.
106 West 3rd St. Cincinnati, Ohio

"Electrical West" Editors Cover Pacific West on Frequent Trips

Wayne Snowden, ELECTRICAL WEST engineering editor, has just returned from a 5-weeks' trip through Utah, Colorado, Texas, Wyoming, New Mexico, Arizona and southern California. He visited Salt Lake City, Denver, Estes Park, Pueblo, Colorado Springs, El Paso, Phoenix, Los Angeles, Pasadena, Riverside and San Diego.

W. A. Cyr, ELECTRICAL WEST associate editor, will attend the annual convention of the National Electrical Contractors' Assn., at Philadelphia, October 9 to 12. He is being sent to the meeting by the Electrical Contractors' Assn. of Northern California, of which he is secretary, for the purpose of reporting the national meeting to the California membership.

During the course of a year, ELECTRICAL WEST's editors travel in excess of 40,000 mi. for the purpose of keeping the readers of the magazine up-to-date on all electrical happenings west of the Rocky Mountains.

NEW OFFICERS and directors of the Bureau of Radio & Electrical Appliances of San Diego County were named for the coming year. Elmer B. Hazie, San Diego Auto Electric Co., was appointed president, with Ben Rogers, Firestone Service Stores, 1st vice-president and R. E. Harris, San Diego Standard Electric Corp., 2d vice-president. Sam L. Hall, Electric Supplies Distributing Co., was elected treasurer. Directors named were H. L. Benbough, Jr., Taylor Brown, Harry Callaway, A. K. Chamberlain, Gordon Dawwon, Paul A. DuPont, Glenn Dutton, C. W. Kinmore, Archie Marsden, E. W. Meise, R. T. Redfield and P. P. Schmitt.

TRANSMISSION ENGINEERING CO., manufacturers' representatives in San Francisco, has moved to 259 Second St., according to A. Pedersen. The company represents The Falk Corp., Galland-Henning Mfg. Co., Stearns Magnetic Mfg. Co., Struthers Wells-Titusville Co., United Iron Works and Crane Packing Co.

DIETRICH'S ELECTRIC SHOP, Vista, Calif., has joined the ranks of new electrical contracting firms. Emil H. Dietrich is the proprietor, with many years experience in southern California as an electrical contractor with utilities.

ESCONDIDO ELECTRIC CO., Escondido, Calif., recently opened their doors, with L. H. Baker, formerly an electrical contractor in Montana, in charge.

ANDREW G. OREAR, 1325 Maple, Los Angeles, president of Trade-Wind Motorfans, Inc., and representing The Torrington Mfg. Co. on fans and blowers in Los Angeles, has been appointed Torrington representative for Northern California as well as Southern California and Arizona. Nadon Engineering Co. will continue to handle these fans as jobber in San Francisco.

CLASSIFIED SECTION

● COST of undisplayed classified ads is 5 cents a word, minimum $1.00 insertion. Box numbers in care of our San Francisco office count as 10 words additional in undisplayed ads. ● RATES per column inch of displayed ads is $3.75. ● All classified ads are payable in advance.

OPPORTUNITY WANTED: Graduate electrical engineer, 17 years experience in engineering, constructing, operating electric and water utilities, now desires connection on West Coast in engineering or engineering sales. Box 101, Electrical West, 68 Post St., San Francisco, Calif.

G.C.A.
Lamp Replacers
Lamp Base Removers
Cartridge Fuse Tongs
Switch Hooks
Send for Catalogue
We have been making safety tools for 24 years
THE G. C. A. Manufacturing Co.
Pittsfield, Mass.

ELECTRICAL TESTING LABORATORIES
Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.
2 East End Ave. New York

TORK CLOCKS

NEW ELECTRICALLY DRIVEN 1939 MODELS NOW AVAILABLE
WITH PLAIN OR ASTRONOMIC DIALS

Whenever it is desired to turn Current on and off Regularly there is a new model Tork Clock that can do it.

THE TORK CLOCK CO., Inc.
MOUNT VERNON, N. Y.

Representatives:
A. R. Slimmon, 445 E. 3d St., Los Angeles
Nicholas & Cook, 1063 Howard St., S. F.
H. M. Sayers, 1019 Eastlake Ave., Seattle
Stevens Sales Co., 41 P. O. Place, Salt Lake City

ABOUT PEOPLE

Colwell Completes 35th Year With Graybar Electric

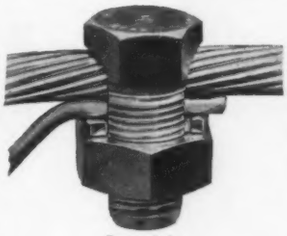
James I. Colwell this summer completed his 35th year with Graybar Electric Co. He is at present Northwestern district manager for Graybar, with offices in Seattle. Graduating from Princeton in 1904, he went with Western Electric Co., working in various departments, preparing for a position in Seattle.

This office was opened in 1907, and Colwell was made assistant treasurer there. After spending several years in the Chicago and New York offices, he returned to Seattle and later was appointed Northwestern district manager. He has acted on various committees of the Pacific Coast division of NECA, and served ten years on the executive committee of the Northwest Light & Power Assn.

A. O. MANGOLD has been transferred from Northwestern Electric Co.'s engineering department to its executive department, where he will function in a new capacity, that of system-betterment engineer. This assignment involves detailed study of system economics, and he will turn his attention particularly to new bases for extending rural service into areas of low customer density.

W. C. MAINWARING, merchandising manager of British Columbia Electric Railway Co., was elected vice-president of the Canadian Electrical Assn. at its recent convention in Digby, Nova Scotia.

One of the **SHELDON CONNECTORS**



Type DC.

Now Distributed in California by

HENGER-SELTZER CO.

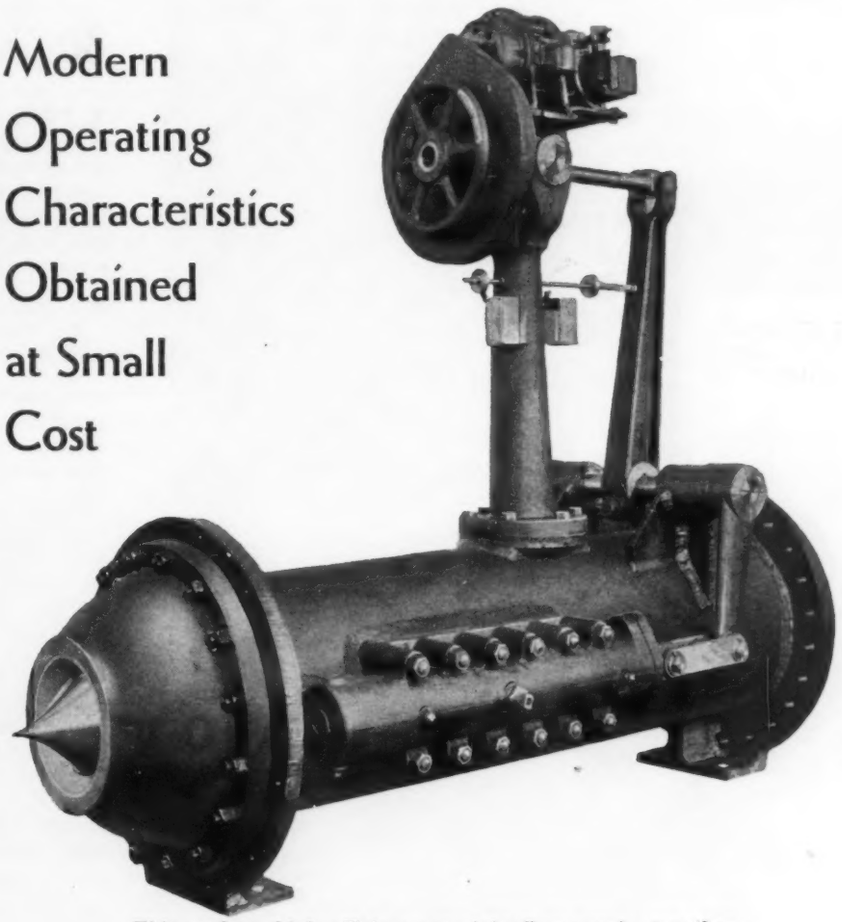
Sheldon's Split-Bolt Connector is the original tap connector designed to reduce frictional losses between threaded parts. Knowledge of these frictional losses has given engineers an entirely new basis for making comparative tests on connectors. The less friction to overcome in tightening the nut, the greater the clamping effect on the cable. Other design features incorporated in this connector make it one of the best available.

Complete stocks available in Los Angeles and Oakland.

SHELDON SERVICE CORPORATION

24-15 Forty-third Avenue Long Island City, N. Y.

Modern Operating Characteristics Obtained at Small Cost



This modern, high efficiency straight-flow nozzle, together with a runner of latest design, was practically all the hydraulic equipment needed for modernizing a thirty-year-old plant in California. From the standpoint of power output, operating cost, efficiency and safety, the modernized unit is far superior to the original installation, reconstruction costs having been comparatively insignificant.

Further details on this and other rehabilitated plants may be readily secured from Pelton engineers.

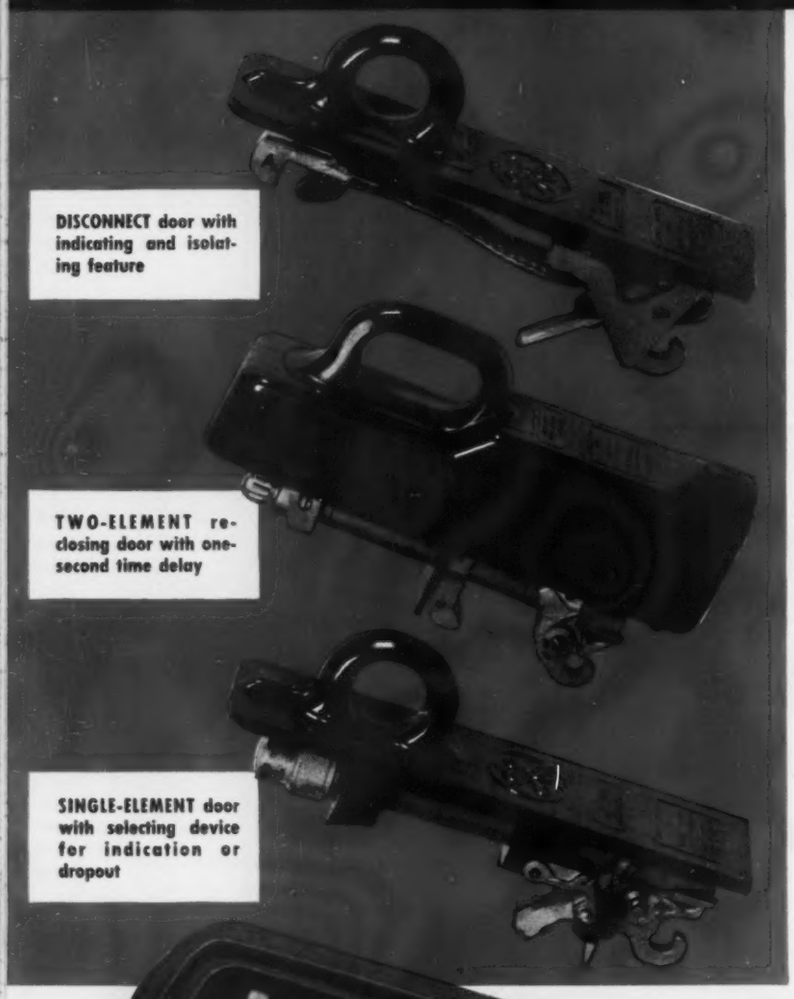
The Pelton Water Wheel Company

HYDRAULIC ENGINEERS

120 Broadway NEW YORK | 2919 Nineteenth St. SAN FRANCISCO | Paschall Station PHILADELPHIA

PELTON

WANT TO REDUCE STOCKS—SAVE TIME AND TROUBLE?


DISCONNECT door with indicating and isolating feature
TWO-ELEMENT reclosing door with one-second time delay
SINGLE-ELEMENT door with selecting device for indication or dropout

Let the Doors Do It

2 housings and 3 doors meet 80% of your cutout requirements

HOW many *different* cutouts do you carry in stock? How many different fuseholders? Really, it's a revelation to learn what you can do to simplify the job of your storekeeper and lineman—and get greater flexibility of cutout application—if you will use G-E enclosed indicating and dropout fuse cutouts.

For example, you can take care of 80 per cent of your distribution fuse cutout requirements with just *five* major parts.

And the best of it is that you can adopt this simple program very easily. You don't have to stock all five of these parts immediately. Here's the way you do it:

First: You buy our 50-amp indicating and dropout fuse cutout in the 5- and 7.5-kv ratings. (Perhaps you're doing that now.) That gives you two housings to take care of all voltages not exceeding 8 kv (13.2 kv Gr Y) across any one cutout. The doors are identical and interchangeable.

Suppose you are ready to use reclosing cutouts at sectionalizing points or on branch circuits or at transformers serving important customers or located in out-of-the-way places. You have already installed G-E indicating and dropout cutouts. All you do is take a G-E two-element ***reclosing door,*** send out a trouble crew to change doors. No line crew required —no installation costs—and they are the lowest-cost expulsion type.

What about disconnects? Simply take our new design disconnect door. This, too, fits both housings. Furthermore, it has an indicating and isolating feature that saves time and makes for greater safety.

Two housings and three types of doors. General Electric is the only manufacturer who offers this stock-reducing, money-saving combination. Why not look into it today? General Electric Company, Schenectady, N. Y.

GENERAL ELECTRIC

Mulvany Named San Francisco Maydwell & Hartzell Manager

Fred A. Mulvany has joined Maydwell & Hartzell, engineers and manufacturers' representatives, as San Francisco district manager. He has been associated wtih the electrical industry on the Pacific Coast for more than 25 years, starting with the Great Western Power Co.

Mulvany also served the old Pacific States Electric Co. (now the G-E Supply Corp.) as transmission specialist both in the Northwest and in San Francisco. He was with the RCA Radiotron Co. as Pacific Coast manager before he went with Leo J. Meyberg Co., as sales manager, appliance department. Leaving this company, he assumed his new position.

ELWOOD BACHMAN, of the G-E industrial sales department at the Salt Lake City office, has been made engineer of that office, according to commercial vice-president A. L. Jones. He succeeds Dr. H. T. Plumb, who has retired under the company's pension plan. Bachman is a graduate of the University of Utah, with a degree in electrical engineering. Upon graduation he entered G-E's employ, being transferred to Pittsfield in 1917, and in 1919 being sent to the San Francisco office as a supply salesman. Since 1920, he has been in Salt Lake City as a salesman in the G-E power and mining department.

GERALD P. LEE has been named superintendent of the electrical department of the city of Roseville, Calif. Lee had been chief electrician under George Knoff, former superintendent, for the past seven years.

DR. C. F. WAGNER, Consulting transmission engineer of Westinghouse Electric & Mfg. Co., is to tour the Pacific Coast and the western AIEE section during October. His schedule will include Butte, Mon. Oct. 16; Spokane, Wed. Oct. 18; Vancouver, Fri. Oct. 20; Seattle, Mon. Oct. 23; Portland, Tues. Oct. 24; San Francisco, Fri. Oct. 27; San Diego, Mon. Oct. 30; Los Angeles, Tues. Oct. 31; Salt Lake City, Fri. Nov. 3 and Denver, Mon. Nov. 6. Dr. Wagner will speak on "Mechanical Analogy of Transmission Line Surges."

P. G. & E. Makes Several Personnel Changes

Several changes in duties and responsibilities of the general office sales personnel of the Pacific Gas and Electric Co. have been announced by O. R. Doerr, recently appointed general sales manager.

F. U. Naylor has been appointed administrative assistant in charge of coordinating use of sales promotional data, material and literature, employee business building programs, sales training and other administrative assignments. A University of California graduate, Naylor has been in the company's sales department since 1921.

H. N. Carroll has been appointed manager of commercial and industrial sales. After graduating from the Missouri School of Mines Carroll worked with several mining companies in the middle west. Later he went to Colombia, South America, in charge of survey work for one of the Standard Oil subsidiaries. He joined the sales staff of the San Joaquin Light and Power Corp. in 1923 and later was on the sales staff of the Great Western Power Co. He joined Pacific Gas and Electric at the time of the Great Western-P.G. and E. merger.

B. W. Reynolds has been made manager of domestic sales. He first joined the Pacific Gas and Electric commercial department in 1923 following his graduation from the University of California. After two years of dealer coordination work he left the company to join the Sterling Furniture Co., of San Francisco. In 1929 he became managing director of the Retail Furniture Assn., of San Francisco, and in 1930 returned to P. G. and E. as manager of dealer sales promotion.

A. M. Frost will continue as manager of agricultural sales. Frost joined one of the predecessor companies of the San Joaquin Light & Power Corp. in the early days of electrical development of California. He held successive sales positions with San Joaquin Light & Power until he became commercial manager. Later he was sales manager of the Great Western Power Co.

Nicoll Named Assistant To Graybar President

Alfred H. Nicoll, for many years San Francisco district manager of Graybar Electric Co., Inc., has been appointed assistant to President Frank A. Ketcham and will leave Nov. 1 for Graybar's New York headquarters. The well-deserved appointment takes another Westerner to the East and in an outstanding promotion.

"Al" Nicoll was born and educated in San Francisco. His electrical career began in 1907 as a lamp salesman for M. A. Bryte. In 1909 he applied

to W. S. "Bill" Berry, beloved manager of Western Electric's supply department, for a sales job. He got it—as sales record clerk. Later he was made sales assistant in the telephone and power apparatus departments. In 1912 he was sent to the Salt Lake house and eventually became its sales manager. In 1920 he returned to San Francisco as specialty sales manager in charge of merchandising. In 1925 he became sales manager and on July 1, 1932, was made district manager.

He has always been active in the electrical industry, being a past president of the San Francisco Electrical Development League, former chairman of the PCEA Business Development Section and a director of the PCEB.

J. P. Carson, sales manager of the Los Angeles district house, will succeed Nicoll in San Francisco, according to Harry L. Harper, Southwest manager. Carson's place will be taken by W. P. Guy, branch manager at Hammond, Ind.

O. P. CLEAVER, Westinghouse lightning engineer at Bloomfield, N. J., will have several speaking engagements under the auspices of the Hawaiian Electric Co., Hawaii, describing and demonstrating new light sources and their applications. He will also discuss the developments of the lamp research laboratories foreshadow lighting. R. W. Murphy, Pacific Coast district manager of the Westinghouse lamp division, is accompanying Cleaver on his tour.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Electrical West, published monthly at San Francisco, Calif., October 1, 1939.

State of California, } ss.
County of San Francisco }

Before me, a notary in and for the state and county aforesaid, personally appeared George C. Tenney, who having been duly sworn according to law, deposes and says that he is the Editor of Electrical West, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresse s of the publisher, editor, managing editor and business manager are:

Publisher, McGraw-Hill Company of California.....68 Post St., San Francisco, Calif.
Editor, George C. Tenney.....68 Post St., San Francisco, Calif.
Managing Editor .....None
Business Manager .....None
Manager .....Roy N. Phelan, 68 Post St., San Francisco, Calif.

2. That the owners are: Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.

McGraw-Hill Company of California, San Francisco, Calif.; McGraw-Hill Publishing Company, Inc., New York City; James H. McGraw, New York City; R. A. Balzari, San Francisco, Calif.; N. A. Bowers, San Francisco, Calif.; George A. Tenney, S anFrancisco, Calif.; John W. Otterson, San Francisco, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amounts of bonds, mortgages, or other securities are: None.

GEORGE C. TENNEY, Editor.

Sworn to and subscribed before me this 22nd day of September, 1939.

(SEAL) W. E. SCHORD,
(My commission expires March 22, 1942)

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TRANSFORMERS, POWER AND DISTRIBUTION
Gardner Electric Manufacturing Co.
CURRENT TRANSFORMERS, NIAGARA AIR INSULATED
Lee Skipwith Company
CABLE GRIPS
Kellems Products, Inc.
CONNECTORS, GROUND ROD CLAMPS, UTILITY HOIST
Jasper Blackburn Products Corp.
GUY WIRE PROTECTORS, CONE ANCHORS, EARTH AUGERS
The Specialty Device Co.
GROUND LINE POLE AND GREEN WOOD TREATMENT
Osmose Wood Preserving Company
TONG TEST AMMETERS—LOW VOLTAGE GENERATORS
Columbia Electric Mfg. Co.
UNDERGROUND CABLE TOOLS & EQUIPMENT
T. J. Cope, Inc.
TREE TRIMMING EQUIPMENT
TREE SURGEONS' TOOLS
Bartlett Manufacturing Co.
FRICTION AND RUBBER TAPES
Clifton Manufacturing Co.
METER JEWELS
Herman D. Steel Company
SAFETY LINE TOOLS
Burnham Line Tool Company

Stocks at San Francisco
Electrical Specialty Co., Inc.,
316 Eleventh Street

Stocks at Los Angeles
Electrical Specialty Co. of So. Calif.,
451 South San Pedro Street

Stocks at Seattle
Electrical Specialty Co., Inc.,
714 Fourth Avenue

For the Coast Trade

At your doorstep you now have an adequate stock of popular D-H alloys, wires, ribbons, rods and other forms.

Driver-Harris Company
Harrison, N. J.

TRADE MARK REG. U.S. PAT. OFF.
Nichrome

J. J. NANCE has been appointed general sales manager of the Easy Washing Machine Corp. He is widely known in appliance merchandising circles, earning recognition with his work with the Frigidaire Division of General Motors for the past 12 years. His most recent post was vice-president and general sales manager of the Delco Frigidaire Conditioning Division.

C. W. MORGAN, formerly of Pasco, Wash., has purchased the McKain Sales and Service Co., Spokane, which he will operate under the name of Morgan Sales Co., featuring Kelvinator, Westinghouse and Zenith lines. Morgan has announced the organization of an outside sales force and a vigorous sales program.

A. V. THOMPSON, for many years with General Electric on the Pacific Coast, is now associated with the Robt. B. Young advertising agency, San Francisco. For the past two years, Thompson was the special representative for A. F. Dickerson, of the G-E Illuminating Laboratories, Schenectady, and was active in the preliminary planning and engineering of the Golden Gate International Exposition illumination.

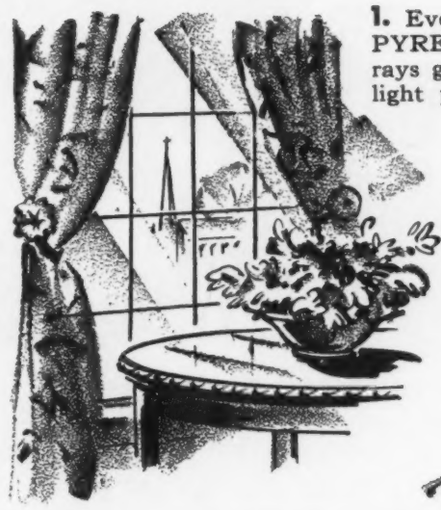
WILLIAM THIEL was elected president of the Big Bend trading area unit of the Inland Empire Electrical Equipment Assn. at a recent meeting in Ritzville, Wash. He succeeds W. C. Raugust, who recently resigned.

DWIGHT F. HENDERSON, formerly a partner in Austin-Henderson Co., Spokane electrical contractors, has joined Brown-Johnston Co. as manager of the industrial wiring department, according to J. F. Boothe, Brown-Johnston retail manager. Henderson replaces Paul Hayden, who has accepted a position as secretary of the Spokane Electrical Contractors' Assn.

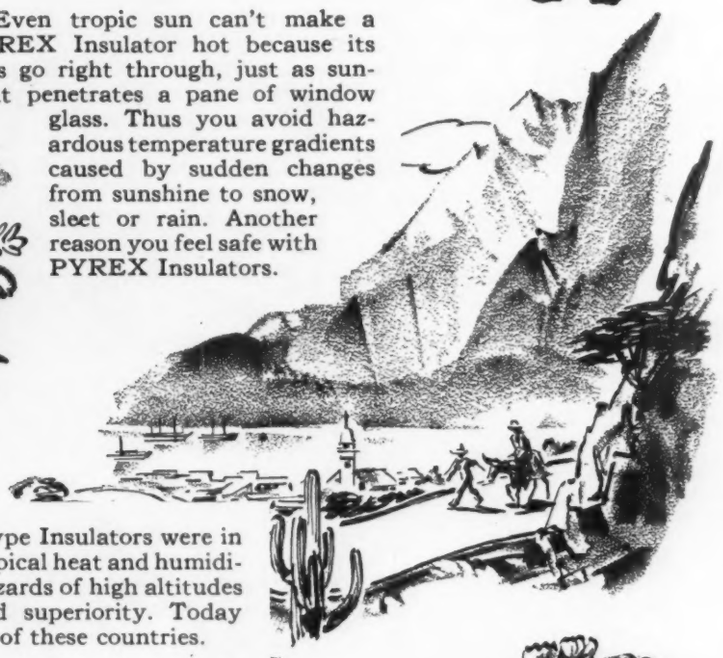
GLEN H. SMITH, 54, veteran assistant superintendent of Seattle City Light, who since 1907, was J. D. Ross' outside construction engineer in the building of Seattle's municipal lighting system, was killed by an electric shock in Louisville, Ky., Sept. 10, where he was vacationing.

Smith came to City Light after graduating from the Univ. of Washington with a degree in electrical engineering. He was appointed superintendent of City Light by Mayor Frank Edwards in 1931, when Edwards removed Ross for a period of several months.

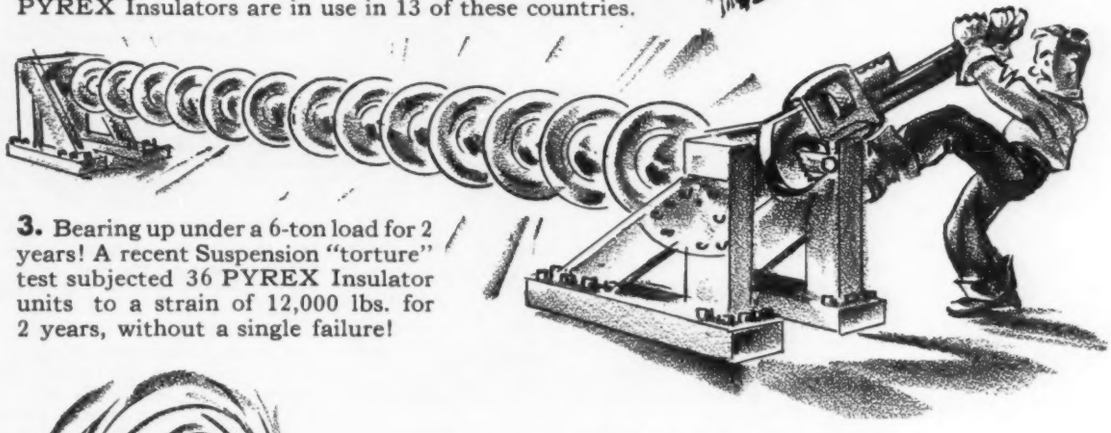
BELIEVE ME! By HARDGUY PETE



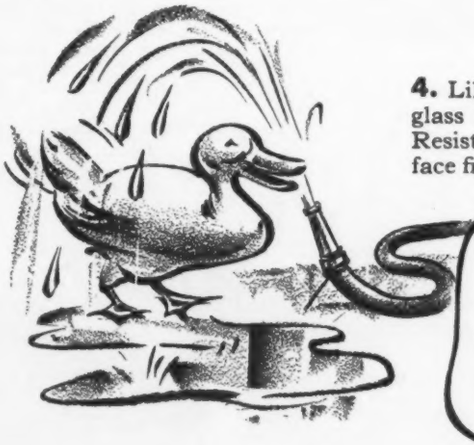
1. Even tropic sun can't make a PYREX Insulator hot because its rays go right through, just as sunlight penetrates a pane of window glass. Thus you avoid hazardous temperature gradients caused by sudden changes from sunshine to snow, sleet or rain. Another reason you feel safe with PYREX Insulators.



2. As early as 1927, PYREX Pin Type Insulators were in use in Latin American countries. Tropical heat and humidity, seacoast salt deposits and the hazards of high altitudes serve only to prove their balanced superiority. Today PYREX Insulators are in use in 13 of these countries.



3. Bearing up under a 6-ton load for 2 years! A recent Suspension "torture" test subjected 36 PYREX Insulator units to a strain of 12,000 lbs. for 2 years, without a single failure!



4. Like water off a duck's back! PYREX brand glass is non-porous—can't absorb moisture. Resistant to alkalies and acids alike, its surface fights contamination, corrosion or pitting.

INVITATION TO POWER MEN!

It's open house at Corning anytime you're nearby! Drop in and see how we make glass—and why PYREX brand glass makes better insulators!

PYREX INSULATORS

"PYREX" is a registered trade-mark and indicates manufacture by
CORNING GLASS WORKS, CORNING, N.Y.

Visit the Glass Center at the New York World's Fair

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PROFILES OF THE MONTH

John A. Lewis, Washington Water Power Co., complete with stovepipe, stogie and aces up his sleeve, entered in the spirit of the Inland Empire Golden Jubilee celebrated last month

R. E. McDonough, manager commercial sales, Montana Power Co., is snapped at the IES convention in San Francisco, discussing his company's position in the fluorescent field

Walter D. Howell, Pacific Gas and Electric East Bay sales department, last month was transferred to the San Francisco general office, where he succeeded W. H. Park, who was named manager of the P. G. and E. Berkeley-Albany office. Howell will be in charge of industrial power work formerly handled by Park

The Golden Gate International Exposition paid tribute to A. F. Dickerson (left), director of General Electric's Illuminating Laboratory, at the recent national convention of the IES in San Francisco. Dickerson designed and supervised the exterior lighting at the Fair, the details of which he incorporated in a paper presented as one of the features at the convention. William P. Day, vice-president and director of works at the exposition, is presenting Dickerson with a scroll with a special proclamation signed by Exposition President Leland W. Cutler, which says: "In tribute to the 'modern Aladdin' whose genius created a magic city of light on Treasure Island"

Preview of coming campaigns by

P·G·and E·

COMMANDS MORE SERVANTS THAN ALADDIN'S LAMP

ELECTRIC APPLIANCE SOCIETY

A DOUBLE-BILL FOR OCTOBER

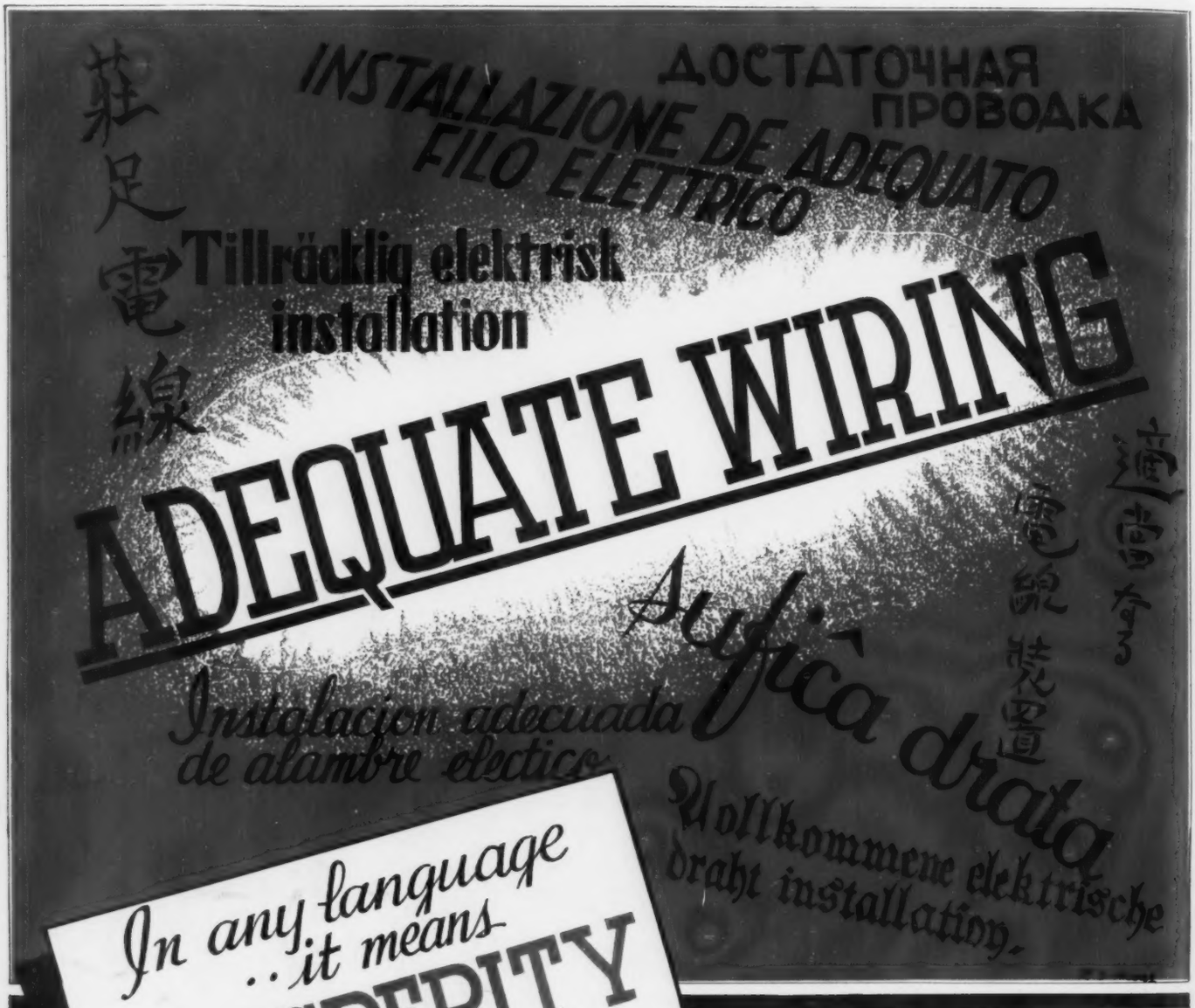
Electric Range and Water Heater In valley communities and mountain rural areas where electric cooking has wide public acceptance and where present users of electric ranges are excellent prospects for electric water heaters—P. G. and E. will carry promotional newspapr advertising on electric ranges and water heaters during the week of Oct. 23.

Better Lamps for Better Light Newspaper copy designed to promote sale of higher Better Sight Floor Lamps will appear with full newspaper coverage in P. G. and E. territory during the week of October 30. Good reason why copy proves that quality lamps are better bargains than bargain price merchandise.

You will want to use tie-in advertising alongside these October electric ads.

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Electric Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Electric Appliance Society, 1355 Market St., San Francisco, Calif.

EW 110-1039



In any language ..it means

PROSPERITY TO THE ELECTRICAL INDUSTRY

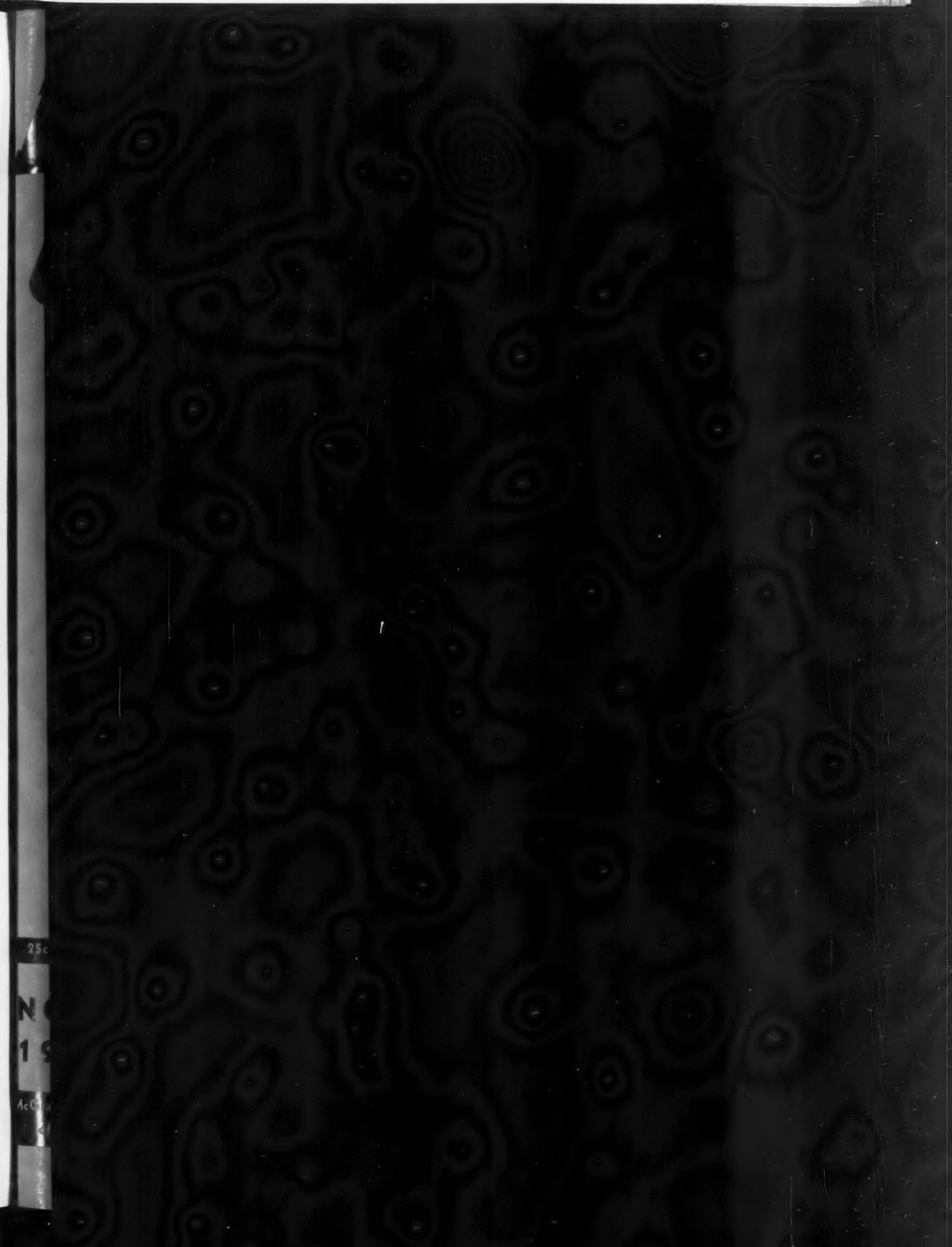
The best salesmen you can hire can't sell electrical appliances, or equipment, or service if wiring won't admit of its efficient use.

Adequate wiring is the key to unhampered expansion of the industry as a whole and your business in particular.

If wiring standards are to be raised it is not a job for any one branch, but for the entire industry.

In your literature and advertising copy, include a line or two as a reminder that your appliance or equipment or service is at its best where wiring is adequate.

★ *Pacific Coast Electrical Bureau* ★

447 Sutter Street, San Francisco, California

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